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Management of design as a translation process

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LIMAC PhD School
Department of International Business Communication

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MANAGEMENT OF DESIGN AS A TRANSLATION PROCESS

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Foreword

Writing this section was certainly complicated; it has been the last one, and there are so many persons I would like to thank. The thesis is the result of a network construction, and during these three years of voyage a consistent number of actors made it possible.

In particular, I would like to thank my supervisors, John Christiansen and Claus Varnes, for having believed in the project, for being good mentors in all the discussions, feedback, suggestions and encouragements. Being part of your team has been an incredible learning "maieutic" experience (professional and human).

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Abstract

This dissertation proposes a new perspective on management of design by regarding it as a translation process, using a framework based on Actor-Network Theory. Within the field of management of design, design has been defined as a problem-solving activity, a tool for either improving the decision-making process or for fostering radical innovation by making sense of things. Designers have generally been considered individuals with a different sensibility, able to make a difference by producing interesting and intriguing products which can deliver value to the customers and create value for the firm. Actor-Network Theory is a methodology for the socio-technical analysis that treats the actors as enacted and relational, and explores the network creation through an analysis based on a flat ontology, in which there is symmetry between human- and non-human actors. There is no a priori size, power or complexity of the actors, as these elements are built through the relations and understood by following them. The study is based on an ethnographic investigation of three design objects: the Serie7, the Egg (designed respectively in 1955 and 1958) and the Ice (designed in 2002), manufactured by Fritz Hansen. Based on the analysis, a new interpretation of the design, the design process, the role of the managers and designers, the value creation process, and the role of technologies of managing is presented.
Design is defined as an outcome of the construction process of things made by mobilising and enrolling actors through the translations of goals. The design process is the process of enrolling, mobilising, and translating goals, creating the design in a heterogeneous network of allies. It is a chaotic practice, muddled and contingent, with the inevitable risk of unintended consequences. This process is guided by the managers, who act as spokespersons, while the designers are macro-actors, representing all the actors involved in the creation process, in the multitude making or agreeing on the final decisions concerning the design and its development during the life cycle of the object. The individual qualities of insight, intuition, vision, and creativity are reinterpreted and assembled in the language of the design. These qualities are no longer the properties of an individual, but collective virtues in relation

to which governing and managing have a fundamental role. The managers are spokespersons, actors who translate the needs, the expectations, the demands and the desires from different actors. They work towards sharing the goals by encouraging the other actors to adhere to the programme of actions. The value is constituted and forged through the relationships, it is not something that is proper or embedded in the product, but is adopted and adapted by the allies in the network. The technologies of managing are not simple tools for fostering creativity, as described in the previous literature, they are actors mediating the process and conveying information that managers can use to make decisions. The technologies of managing are identified as black boxes and leaky black boxes. A black box is totally closed, a leaky black box is something the managers are working and acting on, stimulating the translations and actions that are shaping the network, including or cutting off the network actors and features, as well as mobilising actors.

Dansk Resume

Indenfor designledelse er design blevet defineret som en problemløsningsaktivitet, et redskab til at forbedre beslutningsprocessen eller som et redskab til at fremme radikal innovation. Designerne er generelt blevet betragtet som personer med en ekstraordinær følsomhed, i stand til at gøre en forskel ved at frembringe interessante og spændende produkter, som kan give ekstra værdi for kunderne og skabe indtægter for virksomheden. Denne afhandling foreslår et nyt perspektiv på ledelse af design nemlig ved at betragte design som en "translation process", baseret på aktør-netværk teori. Analysen anvender en metode til socioteknisk analyse, der behandler aktørerne som "enacted" og relationelle i forhold til andre aktører og udforsker skabelse af netværk gennem en analyse der er baseret på en flad ontologi, hvor der er symmetri mellem humane og ikke-humane aktører. Der er ikke nogen a priori størrelse, magt eller kompleksitet i netværket, da disse elementer er bygget gennem relationer og er forstået ved at følge dem. Afhandlingen er baseret på en etnografisk undersøgelse af tre design produceret af virksomheden Fritz Hansen: Syveren (1955), Ægget(1958) og Ice (2002). Gennem den udviklede teoretiske forståelsesramme muliggøres en ny fortolkning og forståelse af designprocessen og aktørernes rolle i processen, værdiskabelsesprocessen samt de anvendte ledelsesteknologier.

Design er i denne afhandling re-defineret som resultatet af en konstruktionsproces mellem aktører, der omfatter mobilisering og indlemmelse af aktørerne gennem translationsprocesser. Designprocessen er i dette perspektiv en proces af "enrolling", "mobilising" og "translating", og det færdige design skabes i et heterogent netværk af allierede. Det er en rodet og kompleks praksis, med risiko for utilsigtede effekter. Processen påvirkes af ledere, som virker som talsmænd; mens designerne er en blandt mange aktører der er involveret i skabelsesprocessen, der påvirker udviklingsprocessen og den videre udvikling i produkternes livscyklus.

De individuelle kompetencer hos designeren er indsigt, intuition, vision og disses kreativitet transformeres og samles i designet, men disse kvaliteter

er ikke bare individuelle, men et led i det netværk der tilsammen producerer det færdige design under indflydelse af ledelse og styringsforsøg.

Ledere ses som talsmænd, en aktør der oversætter og formidler behovene, forhåbningerne, kravene og ønskerne fra forskellige aktører. Talsmændene prøver at overtale andre til at deltage i den fælles konstruktion, deres netværk af allierede, der muliggør et nyt produkt.

Værdien er konstitueret og smedet gennem relationerne. Værdien af et produkt kan ikke fastsættes selvstændigt eller findes indlejret i produktet, men udtrykkes gennem de relationer og de allierede som produktet kan tiltrække og fastholde.

Ledelsesteknologierne er ikke blot værktøjer til at fremme kreativiteten, som fremhævet tidligere, men ses som aktører der medierer processen og fremfører information som ledere kan bruge til at træffe beslutninger.

I en designproces er nogle af ledelsesteknologierne benævnt som "black boxe" og utætte black boxe. Black boxe repræsenterer områder af netværket, der er stabile og ikke umiddelbart til forhandling.

Black boxe kan være helt lukkede, mens en utæt black box er noget ledere arbejder for at gøre stabil og tæt, fx gennem involvering af aktører der tilfører værdi på en eller anden måde, eller ved at afskære aktører der måtte blive vurderes som værende problematiske eller uønskede.

Overview of the Dissertation

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1
Introduction

This dissertation is the outcome of a network construction. It is the inscription of knowledge created within the processes of mobilisation, enrolment, and translation of a heterogeneous group of actors (semitic and performative entities, both humans and non humans) that agreed on the research question and it was achieved by mobilising the ethnographic method as an actor to enact the reality. The thesis is therefore a networked process that implies following the actors, their realities, their enactment, their actions and the traces they left behind (Latour, 2005). The dissertation, its design and its writing process was a translation process, not only in terms of language through which the data were expressed and collected, but also the translation of goals and interests.
The translation process was initiated by the head of the department and my supervisors, who translated my wish of starting a PhD and the statement of the Danish government into a PhD call. In 2007, the Danish Government presented a document concerning Danish design and the policy of the Danish government to sustain it:

> *Denmark has a tradition for good design, which is internationally renowned. Danish Design was an international trendsetter in the 1950s and 1960s and helped pave the way for international commercial successes in furniture, fashion and hi-fi design, for example. Good design is essential for the ability of Danish products and services to sell at a high price and hold their own in global competition. The Danish Government, therefore, aims for Denmark to be restored to the international design elite. With this publication, "DesignDenmark," the Government presents a white paper on the direction for design policy in Denmark. The publication sets out the Government's vision for this policy and for the*

> *initiatives that will be implemented in the time ahead* (Bendtsen, 2007, pg. 1).

When writing the proposal for the PhD application, my attention was brought to the changes in the definitions of *design* and *management of design*. Over the years, design has changed from being considered a problem-solving activity or an aesthetic ornament to becoming a discussed subject in terms of psychology, operations research, system theory, sociology and a driver for value creation in companies. Therefore, one chapter (Chapter 2 of the dissertation) is dedicated to discussing the past and present perspectives on management of design in organisations (four perspectives are individuated) and one chapter to Actor-Network Theory (abbreviated as ANT) as a framework for understanding management of design (Chapter 3). This framework was suggested by my supervisors and broadly explored during my external stay in Oxford. ANT allows the researcher to enquire into the micro-processes that lead to the emergence of a design and to understand the value creation process. The perspectives analysed in the literature review, instead, present the design process in a linear and unproblematic way. They take into consideration the decision-making process, the use of design for branding, the study of tools for making the innovation happen and the design process more efficient, without focusing on the micro-processes, on how the design emerges, or on the detailed activities and the choices that people working in organisations make. In the past perspectives, the question of who is speaking on behalf of a design and who is supporting it are not systematically investigated, and thus it is unclear who is acting to get the actors and the customers interested during the development phase and during the life cycle. In the ANT framework, there is no distinction between the social, the technologies and the design. By adopting this framework, the intention is to understand how different actors act in such a way as to produce a valuable product, a product that is able to keep the actors attached and interested in it.

1.1 Problem Formulation and Research Questions

In the Oxford Dictionary, design is defined as

> *the work of art and order and arrangement of these multiple entities coming together, and constructing a design product.*

According to this definition, design is an assembled product, a result of multiple interactions of variegated actors; therefore, the semiotic meaning

of an object is a priori indeterminate and constructed. Heskett provided a definition of design that is understood to a certain extent as constructed:

> *the conception of a design is not simply a representation in visual form of predetermined values, but a creative, catalytic process in which external factors interact with the beliefs, talents and skills of individual designers or design-groups* (Heskett, 1980, pg. 8).

ANT (Actor-Network Theory) is used in this dissertation as an analytical framework that brings the researcher close to the definition of Heskett, since he emphasises the integration between problem-solving, meaning-creation, and network construction. ANT focuses on going close to the practices of management while keeping a distance in order to problematise it, (re)presenting these practices, studying how they emerge, maintaining the plurality of voices of the actors, understanding their translations, how they associate, their activities for creating the network, their actions towards enrolling and interessing other actors. ANT allows for the study of the network as a result of numerous agencies constructions (Grint and Woolgar, 1992), not only during the new product development phase, but also during its life cycle, making it possible to investigate how the design object is supported, how actors are interested in it, when it is displaced across time and space as an effect of a intricate variety of actors and situations, springing from multiple and multivariate relations. The way of exploring these practices and micro-actions was defined by choosing three design objects, treating them as actors and analysing what happened during the development of different episodes of their product life cycle by using a co-constructivistic perspective to look at the processes, the enrolments, the mobilisations, the translations and the choices of features to associate or disassociate. The chosen designs for the investigation are the Serie7, the Egg, and the Ice Chair, three chairs manufactured by Fritz Hansen.

This research was conducted by taking inspiration from the book Laboratory Life (Latour and Woolgar, 1979); following its methodology and method, the interactions among different actors and how they pursued their goals were investigated.

The research questions are the result of a process of struggles and negotiations, of understanding different concerns in academia and in the company, Fritz Hansen. The company did not influence the theoretical approach, but being there, talking, gathering data, presenting the results helped to better formulate the subquestions. The PhD thesis is a co-construction of multiple actors who have been interacting and inscribing the results in the thesis. The topic was provided by the PhD call (innovation/ design management), and

we (me and my supervisors) looked for a Danish company that produced objects which were considered classic design in order to understand their history. The supervisors made the contact with Fritz Hansen and got them interested in the project. At the very first meeting with the case company that we approached, the discussion focused on the article that was published in 2010, written with my supervisors (Christiansen et al., 2010) and presenting my research proposal that intended to investigate, how a design product can be managed, and, more generally, how design can be managed and made manageable. The managers present at the meeting found the proposal interesting, and they also asked for a detailed investigation of how value is created for the objects. Formulating the problem was inevitably a hard and long journey, and a complex process of merging personal interests, literature, and analytical framework.

The stated problem is:

> *How does a design product emerge if it considered and understood as a network effect, and what are the managerial implications?*

After having identified the problem, it was divided into meaningful and more manageable research questions, with the purpose of slowing down the research process and understanding the complexity of the issue, reflecting on the problems that were emerging and on the struggles that were necessary to overcome.
The research questions are:

1. How can different perspectives on management of design be identified? Which are the past and the present perspectives on design and on management of design?

2. How can management of design be understood through the lenses of actor-network theory?

3. Which methods are suitable for conducting the analysis?

4. For each design object (Serie7, Egg, Ice):

   (a) Who are the actors in the networks?

   (b) What translations, mobilisation, enrolment, spokespersons can be identified?

   (c) What are the features of the products that are associated and disassociated?

5. What are the cross case observations/learnings?
   (a) What are the implications for the theory (learning from ANT versus using other perspectives)?
   (b) What is the role of technologies of managing in the process, which technologies are mobilised and which are used to manage design?
   (c) What are the managerial implications (what does management mean if design is considered a network effect)?

In order to answer the research questions, the analysis was divided into three sections: Serie7, Egg, Ice, and each section presents episodes chosen by looking at the PLC (product life cycle). For each episode, it was investigated who the actors enrolled in the networks were and how they were mobilised and enrolled (through which actions? Who was the spokesperson of these actions?). Each episode also presents the features that were associated and disassociated. The approach chosen for answering the research questions was inspired by the method described by Latour and Woolgar (1979) and Latour (2005): an ethnographic research to study the management of design process and to follow in detail the actors in their activities, analysing the traces that they left. The thesis is meant to analyse designs during the product development process and the life cycle of the product, the work of designers, the work of the managers and all the actions involved. The study proceeds by looking at the network construction, the mobilisation, the enrolment and the translation process, which have been the features associated and disassociated in the different episodes.

1.2 Management of design using ANT- an emerging perspective

The Serie7, the Egg and the Ice are the analysed actors and their network construction is explored. The networks are defined by looking at the product life cycle (PLC): the PLC was used as an analytical tool (the PLC was not given, but calculated) to identify the episodes during which the design was developed and presented in the market, when it had low sales, and when it had an increase in sales. The number of episodes analysed varies, as each design had a different shape of the curve of the life cycle. The analysis has been conducted using Actor-Network Theory (ANT) as methodological framework and ethnography as a method for collecting data. ANT is derived from STS (Science and technology studies) (Woolgar, 2004), and it has

rarely been considered in management of design literature, so it presented challenging reflections on its use. However, it has been used in other fields, such as in innovation management (Akrich et al., 2002b, Christiansen et al., 2008, Christiansen and Varnes, 2007, Christiansen et al., 2010, 2009) and accounting (Briers and Chua, 2001, Mouritsen, 1999, Quattrone and Hopper, 2006).

The search was conducted in Google Scholar, Ebscohost and Web of Science looking for *design management or "design management"* and *Actor-Network Theory.* The choice of using ANT as a methodology is bedevilled by the belief that the life of an actor/object is emergent, and this sociology is aligned with my understanding of the world. However, its use was criticised for being difficult to operationalise (Grint and Woolgar, 1997), and for being more a style exercise in terms of writing rather than a new approach (Collins and Yearley, 1992). Austin and Devin (2012), in their design studies, suggest that the world might be constructed, but they do not investigate further. Also a quote from Heskett can be interpreted as saying that there are no inner essences, no inner kernel in the actors, but that they are constructed through relations:

> *when manufactured, however, a design has a tangible artefact becomes part of the physical reality of its time, applied for specific purposes in a society that conditions how its form is perceived and evaluated. This evaluation may be based on premises different from those of the designer and producer, and it ail be argued that the values attributed to designs in their social function are not fixed and absolute, but fluctuating and conditional* (Heskett, 1980, pg. 9).

The literature review is constructed to present different perspectives on what design has meant, how the definition of design has changed throughout the years, what constitutes design, the role of managers, the role of designers, how value is created and which are the most recurrent (most cited, described and analysed) technologies of managing for each perspective.

This constitutes the basis for what to look for in the analysis, through the lenses of Actor-Network Theory, presenting an emerging perspective, developed through the analysis of the collected data. The choice of using ANT in the thesis was also explained to the managers during our meetings, and they grasped the value of doing so, due to the fact that it can be considered capable of explaining how the micro-processes happened. During the first round of interviews, the design manager and the brand manager admitted that the company had been using the stage-gate model as its main tool for

developing products, as a reference, a sense-making tool for making choices and justifying them. The design manager explained that, according to him, instead, the new product development process happened like this:

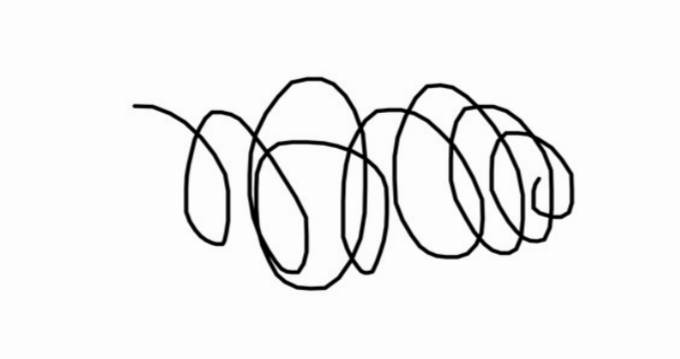

Figure 1.1. The new product development process drawn by the design manager.

Looking at the drawing, I explained to the managers the notion of non-linearity of the process previously researched in other fields (like innovation management), compared to the linear models for design management that are frequently proposed in literature. They could understand the main concepts and relate them to their personal experience, and they could see the advantages of a theoretical framework focused on understanding the process, on looking at how actors support the design during the PLC, and on researching how the actors are framed and kept interessed in such a complex environment, rather than creating models. They became an important supporter of my research.
During the preliminary meeting with the steering committee (described in the Method Chapter), the managers of Fritz Hansen were using (yet unawarely) concepts related to ANT. Despite being these concepts rather unarticulated, the managers could reconnected their personal experiences to the notions of spokesperson, mobilisation, flat ontology, accept the equal importance of human and non-human actors, and understand the strategies of enrolment and translation. In the successive meetings, we (me and my supervisors) explained more in detail the analytical framework for the analyses, and the managers could intuitively comprehend it, being interested in a clarification of how value is co-constructed and a mapping of the actors in the network, which gave me the confidence to continue this investigation.

1.3 Structure of the Thesis

This dissertation is the result of an ethno-methodological study (according to meaning given by Latour (2005)), using a sociological framework that

envisages the analysis of the socio-technical factors by presenting an understanding of the dynamic of the design processes as a network effect, examined both in the product development process and in the product life cycle.
The thesis is structured as follows:

Chapter 1 - Introduction The research questions are presented, explaining the reasons for the choice of this field of investigation, and how the study emerged.

Chapter 2 - Design Management: Past and Present Perspectives The literature review consists of the analysis of four perspectives that have been identified and classified within the literature of design management. These are not a priori perspectives, but the outcome of a resonate study obtained with the use of the co-word analysis, a method that allows the identification of the clusters of related arguments and the delineation of how a field of study has emerged. For each perspective, the design definition, the role of designers, of managers, the design process, the value creation and the role of technologies of management are described.

Chapter 3 - An emerging perspective: Understanding Design with ANT In this chapter, design management is approached using an analytical framework derived from the analysis of Actor- Network Theory (ANT) and defined as "emerging perspective" since it has rarely been used for studying management of design. The analytical framework is delineated.

Chapter 4 - Method The method chosen for answering the research question is the ethnographic method, which includes ethno-methodology, visual ethnography and historical ethnography. The process of gathering data, analysing and writing up is presented.

Chapter 5 - Analysis The analysis is conducted for three designs: the Serie7, the Egg and the Ice. They are analysed in different episodes, chosen by looking at the sales during the product life cycle of each chair. For each episode the allies in the network, the translations, the mobilisations, the enrolments, the spokespersons, the associated and disassociated features are delineated.

Chapter 6 - Cross perspectives learning The discussion is carried out by confronting the results from the analysis with the main findings from the

literature and by understanding how the analysis conducted with the ANT framework can contribute to each perspective of management of design; a section is dedicated to explaining the role of technologies of managing and reflectinf on the managerial implications.

Chapter 7 - Conclusions In this chapter the conclusions, the limitations, the further researches are presented.

1.4 Contributions

The contribution of the dissertation is to propose a new perspective on management of design, based on ANT as a framework, directing the attention to a new definition of design, on a different way of interpreting the management of the design process, the role of designers, the role of managers, the value creation and the role of the technologies of managing.

Design definition Design is defined as an outcome of the process of constructing things by mobilising and enrolling actors through the translations of goals. Translation is defined, in ANT terms, as a drift, as the creation of a link between otherwise disconnected actors and this link creates a new actor: the design. The design is considered an immutable mobile, an actor that is presentable and readable; since it is immutable, it can be mobilised in space and time, without being compromised.

Design process The design process is the process of enrolling, mobilising, and translating goals, creating the design in a heterogeneous network of allies. The design process, based on the translations, is guided by the managers, who act as spokespersons. The design process is a messy practice, muddled, contingent and with unintended consequences which cannot be defined a priori, because it is a process in the making. This happens not only during the development process, but it is constant, always happening in all the episodes analysed in the PLC.

The role of designers The designers are one among the actors involved in the creation process, one among a multitude making or agreeing on the final decisions about the design and the development of the life cycle of the object. The individual qualities of insight, intuition, vision and creativity are reinterpreted and assembled in the language of the design, no longer the

properties of an individual, but collective virtues on which governing and managing have a fundamental impact (Akrich et al., 2002b). Design is constantly in search of allies and the designer is the actor working on capturing the allies' attention, actively mediating goals to enrol other actors in the network, making constant reinterpretations, explanation after explanation, of the features of design. The designer is defined, in this thesis, as a macro-actor (Callon and Latour, 1981), an actor that represents the network of actors designing the object. The thesis contributes to clarify the concept of macro-actor in ANT literature, by explaining that a macro-actor is not a spokesperson, but the representative of a network, and he/she is the conjunction of the process of simplification and juxtaposition with other actors to which they are associated and enrolled.

The role of managers The managers are spokespersons, actors who translate the needs, the expectations, the demands, and the desires from different actors working on sharing the goals to convince other actors to work towards the goals' achievement. The managers initiate and work on the process of designing and working for associating or disassociating features of design, which lead to create value. This is an interpretation that adds to the management of design literature and to the definition of spokesperson in ANT. Managers act by stimulus because they take part of the translation process, they define actions, the associated or disassociated features, and they create frictions to challenge the network construction to understand which are the leaky black boxes that can be acted upon, which are the actors that can be simplified, and which are the actors that should be modified.

Value creation The value is constituted and forged through the relationships, instead of being something that is proper or embedded in the product, but it is adopted and adapted by the allies in the network, and supported by them to reach the customers. The value is created in the process of accepting the features associated and disassociated form the design, which are defined and supported by the spokesperson. Value creation is a never-ending process, during which the value is negotiated by the acceptance of the associated and disassociated features.

Technologies of managing The technologies of managing are not simple tools for fostering the creativity, as described in the previous literature, but are actors mediating the process. They convey informations that managers can use to make decisions. In a design process, the technologies of managing

are black boxes and leaky black boxes (Scandinavian design, Danish design, rubber feet, screws, plywoods, materials that did not change, organic design, veneer, new buildings, financial reports, colours, wood, the values of Arne Jacobsen, Styropor). A black box is totally closed, a leaky black box is something the managers are working and acting upon. They are not a priori defined as leaky or closed, it depends on the work of the actors on them. The thesis also proposes an interpretation of the management work: managing by stimulus, allowed by the black and leaky boxes, acting on the translation process: managers stimulate the translation process by stimulating actions and actively contributing to the shaping of the network, including or cutting off the network actors, features and mobilising actors. Since it is managing by stimulus, oftentimes the consequences are not clear, but are unintended, because the other actors in the network are stimulated and they react to the stimulus, not always in an expected way. Even if the manager has a strong program of action, the actors are undisciplined (Latour, 1988). During the construction process, uncertainty arises - e.g. who the marker is, due to the fact that there are an almost endless number of actors involved in the process (Latour and Hermant, 2010), and the spokesperson cannot always expect that they are following his goals. The technologies of managing allow the managers to create frictions and obstacles to simplify the process, learn from it, and make decisions.

2

Design Management: Past and Present Perspectives

The aim of this chapter is to answer the research question: *How can different perspectives on management of design be identified? Which are the past and the present perspectives on design and on management of design?*

Design management is a diversified field, ranging from engineering topics describing optimisation processes to organisational studies in which it is discussed how to improve the organisational structure by thinking as designers; from how to improve new product development processes through design to the history of industrial design. Due to this wide range, the literature review has been organised in perspectives presented in chronological order. The fields of engineering, architecture, urban planning information systems have been excluded from the review because the knowledge in that field did not contribute to the development of the dissertation on which this thesis is based. The perspectives are not a priori existing, but were created after a co-word analysis, for the first time performed in the design management literature, with the purpose of creating a singular literature review that proposes a comparison between the different schools. Atwood et al. (2002) proposed a citation analysis for examining what the community of design think about design, and classifying the different definition of design. This allowed to define the division of design problems along different disciplines, and the domain of application. The co-word analysis, instead, allows to study the evolution field of design and map the schools of management of design (Callon et al., 1986). For each perspective the following issues are presented and discussed:

- The definition of design - what is design and how it is mobilised;
- The role of designers - who are the designers and what they do during the process;
- The design process perceived - what it is, how it is carried on, how it is described;
- The role of management - what managers do in the design process;
- How value is created;
- Which technologies of managing are considered important and how are they used. The concept of technologies of managing was developed from Foucault's conception of governmentality by Miller and Rose (1990), in which the technologies of managing are created to ensure governance and accountability; the main focus of the paper is the human, the social, and the organisational relations. The authors are investigating and explaining what is happening in the procedures, structures, committee compositions, frequency of meetings, and protocols for reporting the information. The authors propose a neo-foucaultian perspective, arguing that accountability and governability is a matter of complex processes of negotiations and persuasions involved in the assemblage of loose and mobile networks that can bring people and organisations into alignment. Therefore, the form of ordering, management and governance change historically, and the individuals are subjects of technologies, expectations, definitions and classificatory regimes. Departing from this definition, the scope of the review was to indicate the technologies of managing and their role in the design manufacturing firm.

The reason for choosing the aforementioned subquestions arose from the earlier readings of the literature. During the the PhD proposal, I looked into the databases for searching for papers to review; it was confusing to find different definitions of design, different interpretations of the role of designers, the role of the firm in the NPD (new product development process), the definitions of value, and the different tools available for managing a (design) firm. Also, the methodology and the scope of investigation differed considerably from one paper to another. For example, the designers are perceived as a tool for the manufacturing company to create a product that is more appealing to the customers and therefore they are willing to pay a higher price. In others, on the other hand, the designers are described as the only

persons able to understand the unmet needs of society, therefore they are able to create for the companies, that are hiring them as consultants, radically innovative products that are meaningful to the customers. In one book, the designer is defined as bricoleur.
Concerning value creation, value was represented through different definitions: as price, as exchange, as willingness to pay; as a symbol or as a meaning, and it was explained by mobilising different disciplines (anthropology, economics, etc...). The review process was meant to create order out of disorder, comprising the construction and the maintenance of perspectives by analysing the aforementioned introduced issues.
In order to build the literature review database, a method adopted in medicine was followed, and used by Dahlander and Gann (2010), which is described in a paper discussing the state of art on open innovation.
The EBESCO database was used for searching for articles that had *design management* or *management of design* in the topic field, including title, keywords and abstract. This search resulted in 8216 articles downloaded and collected in a database in 2012. However, this search also provided articles that had little connection with design management, for example informatics system design management, design configurations in companies, or in the field of supply chain management. The research was then refined by reading the abstract and keywords and thus it was narrowed to 200 articles in journals in the ABS list.
Since the EBESCO database does not include books, Amazon, Google, and Google Scholar were used to search for books on design management and management of design.
The research was refined using Web of Knowledge. Also, in that case, the search produced a massive number of papers that needed to be disregarded. It was necessary to enrich the database with a reasoned search in the literature review, since a mechanical search was not satisfactory. For example the search in the Web of Knowledge database with the key words "design management" produced only 38 papers when limiting the search to the fields of business and sociology. This was interpreted as an indication that authors of the articles, instead of using the tag design management, might have used other keywords, related for example to the field of innovation and management. Therefore, the mechanical approach to the analysis of the literature, which is widely used in various academic disciplines (for example, operations management, see Pilkington and Meredith (2009)), was not satisfactory, since it left out many papers that were considered relevant, because the authors of the papers downloaded in the database were frequently citing, or referring them as starting point for the research in the specific article, but

did not appear in the search. Using the methodology proposed by Callon et al. (1986) and Latour (1987), an ANT approach to the construction of the literature review was adopted, adapting the motto "follow the actors in their argument construction". The articles from the journals in the ABS list were systematically read in order to summarise the arguments, and to unfold their construction. In particular, the focus was on paying attention to the theoretical premises, to the contributions, and to the authors that the paper in question intended to contribute to. In a separate column, the allies that were mobilised and brought into the arguments were coded, namely authors that were entering into the discourse. The papers were treated not only as inscriptions, but as actors mobilising a network of allies, their strength residing in mobilising the arguments, and being enrolled in the following papers. Following this process, a co-word analysis was performed. The theoretical framework for the analysis was the one provided by Rip and Courtial (1984). The first step was to prepare an Excel sheet with the papers and the books, referring to the authors, year, title, and the attributed keywords of the arguments mobilised in the text. Therefore the codes were not keywords provided by the journal, but rather translations, possible interpretations and structures linking concepts in the analysed paper. The codes were used as discrete entities, structured arguments to make up the actor world through their explanation of how the documents were related, and they were also mechanisms for enrolling other papers in the arguments. Callon et al. (1986) suggest that this method has six effects of negotiating the text: highlighting history and epistemology, setting up a new scenario, setting up inscription devices, negotiating the text, closing objections and trials by order.

After the coding and the creation of the Excel file, the co-word analysis was performed. This method counts the number of co-occurrences of pairs of keywords. The final result can be represented in a co-occurrence matrix which has been calculated with a special program written in Python. The results from the co-occurrence matrix were filtered such that co-occurences with a low Jaccard index were left out of the matrix. The Jaccard index defines the "exclusiveness" to which a set of keywords is appearing and can be calculated by $J_{ij} = \frac{c_{ij}}{c_i + c_j - c_{ij}}$, where c_{ij} is the number of co-occurences between two keywords, and c_i and c_j are the total number of occurrences of the i'th and j'th keyword respectively. A low Jaccard index means that the two keywords under consideration most often appeared *not* together, whereas a high Jaccard number means that when the two keywords are appearing together most of the time. In the extreme cases, a Jaccard number of 0 means that the keywords never appears together, whereas a Jaccard index of 1 indicates that they always appear together.

Rip and Courtial (1984) argue that this method allows to understand the funnel of interests and the evolution in the field. The following figure represents the arguments and how they are put together,the fate of the arguments, and the links of the actor world inscribed in the papers. The success of the argument is made visible by the strength of the linkages presented in the co-word analysis. Three perspectives emerge from the co-word analysis with a Jaccard index of 0.4. The first perspective was added for an argument construction reason: the second and the third perspectives are basing their arguments on Simon (1969). The figure 2.1 enabled the identification the clusters of arguments. Some are strongly connected (like in the 4th perspective) due to the strong agreement with the research agenda.

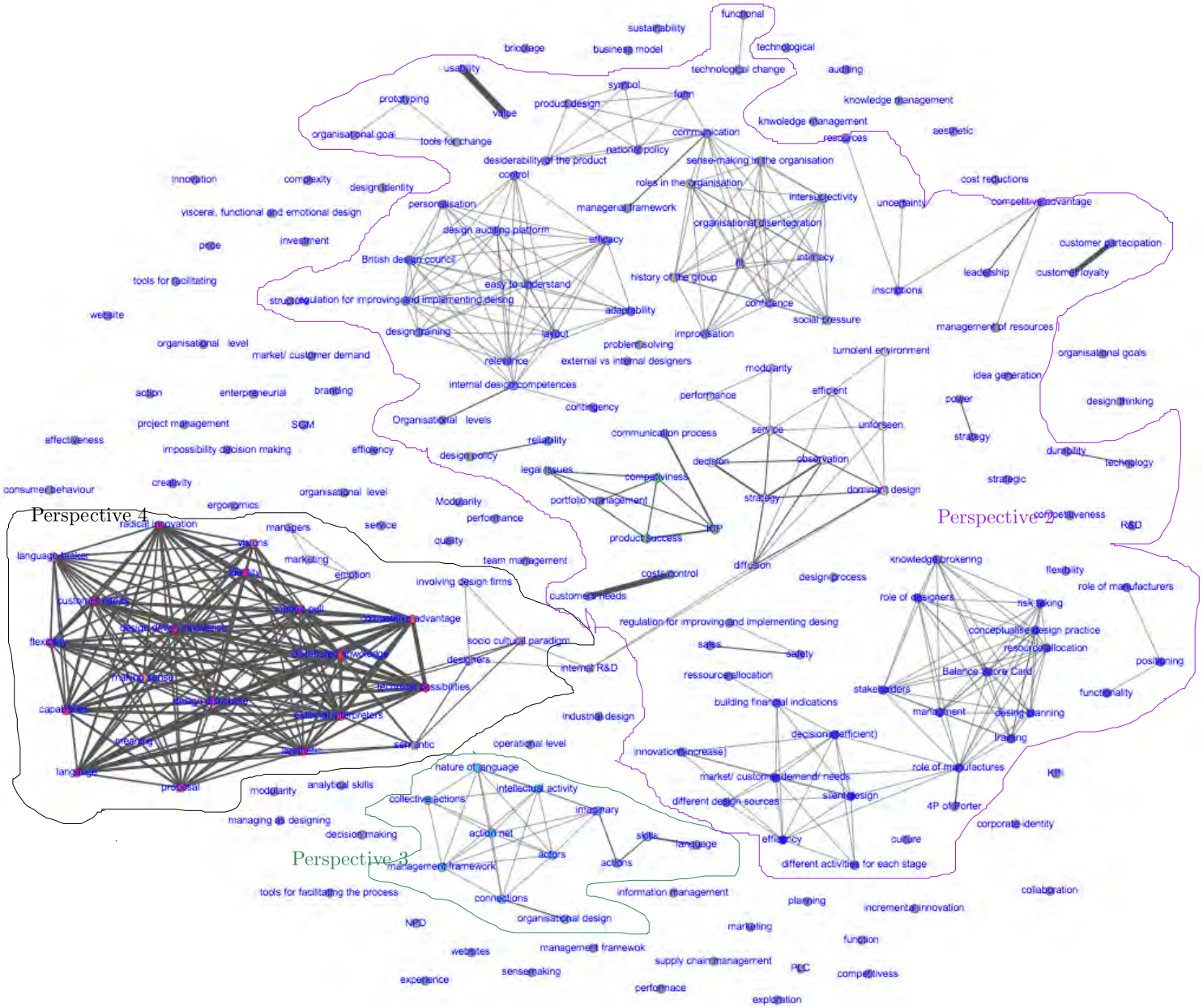

Figure 2.1. Co-word analysis, Jaccard index 0.4. Co-word analysis for identifying the perspectives in management of design literature.

Figure represents the perspectives as related to publication years.

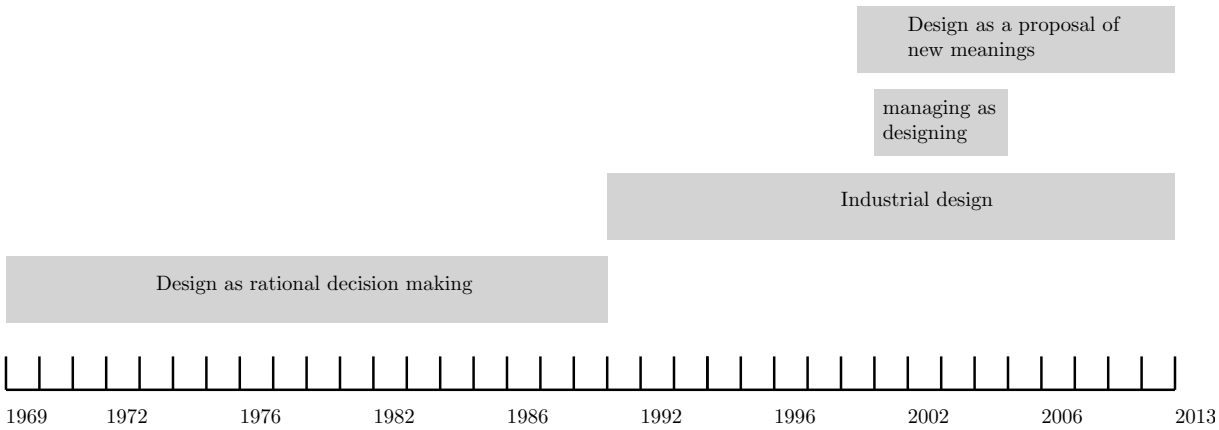

Figure 2.2. Perspectives in management of design literature, ordered chronologically.

In the conclusion of each perspective, except the first perspective because it is based only in one book, it is reported the occurrence of the words. This graphic analysis visualises the most recurrent words for each perspective. After having indicated the perspectives with the co-word analysis, the papers in Appendix A were inserted in Excel and each cell had one of the assigned key words. All the key-words were copied and pasted in one software specialised for this analysis (TagCrowd) and the results downloaded.

2.1 First Perspective: Design as rational decision making

This perspective is based on Simon's famous book, *The Sciences of the Artificial.* This is one of the most cited references among all the perspectives. In the book, he raises for the first time the concern of how design can become a science: design was a sub-topic of engineer studies, not well developed, and not considered prestigious enough to be inserted in the curriculum of the universities and engineering degrees. Through his book, Simon argues why it is important to develop a curriculum of science of design, and how this discipline strives to improve the understanding of design through scientific methods of investigation. To sustain his argument, Simon presents a broad body of knowledge, proposing how to implement the concepts of cognitive psychology, cognitive science, computer science, public administration, economics, management, philosophy of science, sociology, and political science through design and problem solving processes. This perspective was written focusing only on the "Sciences of the Artificial", because most of the authors of the papers downloaded from the database referred to Simon as the founder of the discipline "design management". With this book, Simon aims to give dignity to design, and he believes to be an important matter to be studied and to enrich the preparation of managers.

2.1.1 Design Definition

Design is part of the sciences of artificial, and the two disciplines share a substantial body of research and knowledge, both theoretical and practical. The artificial is defined as being produced by art rather than by nature, not being genuine or natural, but rather affected and not pertaining to the essence of the matter (Simon, 1969, pg. 4). Artificial things are synthesised by human beings, they may imitate the appearance of natural things while lacking, in one or many respects, the reality of the latter' s functions, goals, and adaptations. They are designed in terms of imperatives as well as descriptives. Therefore, design can potentially be related to any discipline:

> *Design, so construed, is the core of all professional training; it is the principal mark that distinguishes the professions from the sciences. Schools of engineering, as well as schools of architecture, business, education, law, and medicine, are all centrally concerned with the process of design* (Simon, 1969, pg. 111).

The logic of design is flexibility, and it makes assertions and inferences on how to interpret the world. Design is concerned with how things ought to be, conceiving and creating artefacts to reach certain goals (Simon, 1969, pg. 114). Simon considers design thinking important for future managers, hence he suggests the development of university-based courses in science of design, including the following elements, held to be crucial for the constitution of design understanding:

- Utility theory and decision theory as a logical framework for rational choice among given alternatives;
- The body of techniques for actually deducing which of the available alternatives is the optimum;
- Adaption of standard logic to the search for alternatives;
- The exploration of parallel, or near-parallel, factorisations of differences;
- The allocation of resources for searching for alternatives, partly explored action sequences;
- The organisation of complex structures an its implication for the organisation of design processes;
- Alternative representations for design problems.

In the first chapters of the book, there is a clear division of what natural science and the science for design is (not only science of design, but science for design, delineating an important study in direction of design), and it is summarised in the following table:

	Natural science	Science for design
Time	Abstract relationships that are independent of historical time for conducting experiments	Present time (real or symbolic) for analysing data; future perspectives when they need to make decisions and sift through the different alternatives
Object of investigation	The natural world	The artificial world
The appropriate methods	Controlled experiment, classification, analysis	Modelling, pattern-forming, synthesis
The values	Objectivity, rationality, neutrality, and a concern for truth	Practicality, ingenuity, empathy , and a concern for appropriateness
Starting point	Defining all the parameters of the problem in order to define the solution	Problem solving starts with a solution in order to start defining enough of the parameters to optimise the path to the goal

Table 2.1. Comparison between natural science and science for design, inspired by Simon (1969).

Having presented the properties of natural science and science for design (summarised in the previous table), Simon affirms that the proper study of mankind is the science of design. Simon uses the word design sometimes as a noun and sometimes as a verb. As noun, the word has the meaning of being artificial. As a verb, it is used in the context of designing alternative paths for making decisions, and achieving a satisfactory design, whose main criteria is the conservation of scarce resources (Simon, 1969). The knowledge of the activities is attained when the person demonstrates that: he/she is mastering utility theory; statistical decision theory; computational methods; algorithms for choosing *optimal* alternatives such as linear programming computations; control theory; dynamic programming; algorithms and heuristics for choosing satisfactory alternatives; imperative and declarative logics; factorisation analysis; means-end for heuristic search; allocation of resources for search; theory of structure and design organisation; and representation of design problems. These are areas that should be studied by people who aspire to become managers, because these are the sources of knowledge that define the optimal decisions-making process, and provide managers with the necessary tools for making decisions. Design is the science for decision making process (Simon, 1969), and the product is the decision, whether it is about the strategy of the firm or the design of a consumer product. The human and computer cognition are engaging in design thinking with a sub-sequential list and processing approach to generate and test options and decisions in the environment. Design, therefore, is the transformation of existing conditions into preferred ones, a process of problem-solving, rooted in the creation of new, useful things and processes for making decisions.

2.1.2 The design process

Design is a process through which decisions are taken, aiming at changing existing situations into preferred ones (Simon, 1969), by designing the courses of actions, and the path trees for the decision making process. The design process is more focused on devising courses of actions or specifying artefacts, rather than in their actual realisation. The design process is about proposing realisable artefacts to others, artefacts that ideally make sense to all of those who have a stake in them, and the devising artefacts should attain goals.
The process of problem solving begins with the representation of the problem space, and the representation of the solution takes place within. An accurate description of how this process is happening is based on the previous book written by Simon, *Administrative Behavior* (Simon, 1976), in which the decision making process is described as the behavioural and cognitive process of making rational human choices. In this book, Simon focuses his attention on operational administrative decisions, and how to make them correct and efficient by through the implementation of a batch of interrelated means. Decision making is a process during which the individual chooses an alternative among a number of presented ones, directed towards achieving organisational goals. The rational decision making is based on the selection of an alternative, knowing all its possible consequences. The decision making process is split into three steps, that are: (1) the identification and listing of all the alternatives; (2) the determination of all the consequences resulting from each of the alternatives; (3) the comparison of the accuracy and efficiency of each of these sets of consequences (Simon, 1976). In the real world, it is very hard to apply a perfect rational decision making process, and no matter how accurate the possible solutions are, the implementation of the selected choices can have unintended consequences. For this reason, the process is supplemented with other techniques or behavioural processes to achieve the optimal solution:

> *The human being striving for rationality and restricted within the limits of his knowledge has developed some working procedures that partially overcome these difficulties. These procedures consist in assuming that he can isolate from the rest of the world a closed system containing a limited number of variables and a limited range of consequences* (Simon, 1976, pg. 82).

His books propose a wide range of human behaviours, cognitive abilities, management techniques, personnel policies, training goals and procedures, specialised roles, criteria for evaluation of accuracy and efficiency, and com-

munication processes to supplement the rational decision making model, by looking how these factors directly and indirectly influence the making of decisions. A good design process aims at conserving the scarce resources, at obtaining an effective management of the resources of the designer, minimising the costs of the structures checked throughout the cost-benefit analysis. The representation in the space (bi-dimensional and tridimensional) is important to the science for design for visualising the decisions, and to explain what the designer thinks, since mental representation is different from 2D or 3D, and can convey different properties (Simon, 1969). From Simon's point of view, anything that gives managers new knowledge provides an opportunity to be more rational. The design thinking is different from the engineer thinking, since it adds a creative component to the process of building ideas. Through the book, some steps for implementing design thinking emerge. They are not defined in a structured way, but they can be reconnected to: 1) defining the issues that need to be solved, the audience, and the criteria for pondering the choices; 2) researching whether there are similar issues in the company; 3) collecting examples to support the choices; 4) weighting of the choices; 5) ideating; 6) prototyping; 7) choosing through the process before described; 8) implementing; 9) and learning. The design process is not an exact science, but it can happen that people make mistakes, and they should learn from their mistakes.

> *The idea of learning from examples can be extended to a method of learning "by doing". Suppose a problem solving system is able to solve a particular problem but does it inefficiently after a great deal of search. The path to a solution finally discovered, stripped of all the extraneous branching in the search, could serve as worked-out example to which the procedures of the previous paragraphs could be applied. Anzai and Simon have constructed a "learning by doing"scheme of this kind for the Tower of Hanoi puzzle which, by solving the problem several times in succession, gradually acquires an efficient and general strategy* (Simon, 1969, pg. 105).

Therefore, the process is a methodology for practical and creative resolution of problems or issues that look for a future result. The design process starts with a goal or the specification of what is meant to be achieved, rather than the definition of a certain problem. Then the process goes on by focusing on the present and the future problems, on exploring the parameters of the problem and the possible resolutions.

2.1.3 The role of designers

> *The engineer, and more generally the designer, is concerned with how things ought to be-how they ought to be in order to attain goals, and to function* (Simon, 1969, pg. 4-5).

The designers have the role of communicating their understanding of the nature of complex things by reducing them to the interactions of their parts to simpler, more fundamental things. A complex system is nothing but the sum of its parts, and an account of it can be reduced to accounts of individual constituents. Simon wishes for a turn in design, since from the industrial revolution much, if not most, of what we knew about design and artificial sciences was considered intellectually soft, intuitive, and informal (Simon, 1969), while it should become a science. One of the main points of the analysis in the book is the difference between what natural scientists and people working with the artificial do. Scientists do "re-search", they repeat a search for patterns within available data that are past happenings by counting a population or designing a controlled experiment. The patterns of data analysis lead to understand the findings as existing a priori to their analysis. Based on these, the scientists construct theories that generalise what the data present, and the nature of the object studied is preserved. Designers are drawing, letting their ideas be represented as following the intuitive flow of thoughts arising during the delineation of the design process. Designers are also prototyping, making models of the artefacts to test form, fit and functionality. Simon highlights the limitation of a technical rationality growing out of engineering. The author corroborates the thesis that engineers are not the only professional designers.

> *Everyone designs who devises courses of action aimed at changing existing situations into preferred ones. The intellectual activity that produces material artefacts is no different fundamentally from the one that prescribes remedies for a sick patient or the one that devises a new sales plan for a company or a social welfare policy for a state* (Simon, 1969, pg. 111).

This means that the role of designers is to plan determined courses of actions or artefacts, not necessarily to realise them. Designers should have broad vision and in designing the process, they should consider for each side the consequences, the solutions that would satisfy the conditions and attain the goals. They assemble problem solutions to problems from components, looking for appropriate aggregation. Designers are equated to biologists, because the organisation is considered an adaptive system (inner) and they

have to understand its characteristics. Simon describes designers as innovative people with different creative competences, working in a wide variety of professions. Designers are part of complex environments, they interact with other persons but also computers and other materials present in the company, they work with all these actors in organised cooperation to solve problems and achieve goals in an outer environment of great complexity. Therefore, they are people with the ability to combine empathy for the context of a problem, creativity in the generation of insights and solutions, and rationality to analyse and fit solutions to the context.

2.1.4 The role of management

The main challenge for managers and design managers is to understand how to foster creative design work, and how is possible to manage creativity, novelty, originality, taste and uniqueness. Managers should have competencies similar to designers, because they need to give form to ideas and shape alternatives plans in case of problems and unforeseen events. However, managers have a limited cognitive capacity for solving problems and making decisions; for this reason, Simon suggests different methods for effective problem-solving. One of the approaches to solve problems is through the representation and the appointment of the values of the solution, which helps to visualise and make decisions. Managers should also communicate the value of design, that resides not only in developing artefacts, but also in designing information systems and organisations. The managers should apply the logic of design in order to choose among alternatives:

> *in this case, where we are seeking a satisfactory alternative, once we have found a candidate we can ask: "Does this alternative satisfy all the design criteria?*(Simon, 1969, pg. 121).

In order to search for alternatives, managers have to install systems connected to the outside environment through the afferent or sensory channels via which they receive information about the environment and consequently act (Simon, 1969). The system is composed by different elements that contribute to the overall function, and the inner environment is defined by describing the functions of those subsystems, specifying the mechanisms. The design of the components can be carried out with some degree of independency in creating the components. Once the components of the decisions are identified, the managers can make decisions based on an evaluation of alternatives for deciding and recomposing the sub-functions, the sub-processes and the sub-areas, and they can choose among different alternatives.

Managers should create and develop a favourable decision making process environment, realising that humans have a limited cognitive capacity for reasoning when searching for a solution within a problem space, due to the relatively small size of the human brain' s working memory. Therefore, only few aspects of the situations can be considered, and it is impossible to sift out all the aspects in the analysis. Therefore, the need of designing the problem, representing the alternatives solutions and we assigning a value to them.

2.1.5 Value creation

Value is created when a problem is solved through a solution that has been designed and chased among multiple possibilities. Since the problem can be solved by preparing a tree with paths of different solutions, the scheme for fastening value to partial paths may be quite different from the evaluation of function for proposed completed solutions (Simon, 1969). The process for seeking problem solutions can be used for gathering information about problem structure, which is valuable for finding a problem solution. Value emerges in the process of reduction to declarative logic, in the domain of the "optimisation methods". It can be calculated with statistical methods, although value is an acting force operating on and through design. Introduction of new design is suggested to be introduced if it is better than the old, otherwise, the old (optional substitution) should be kept.

2.1.6 Technologies of Managing

The technologies of managing allow managers to recognise what is inside and what is outside the systems, retaining choice-design-action schema and choosing how to allocate internally resources, managing the inner and the outer environment

> *Economics exhibit in purest form the artificial component in human behavior, in individual actors, business firms, markets, and the entire economy. The outer environment is defined by the behavior of other individuals, firms, markets, or economies. The inner environment is defined by an individual's, firm's, market's, or economy's goals and capabilities for rational, adaptive behavior* (Simon, 1969, pg. 25).

The inner environment of the design problem corresponds to a set of specified options of action. The value of design resides also in the possibility of having efficient computational techniques for finding optimum courses of action in

a reasonable and real situations. As described in the break, the technologies of managing allow for decisions making, where there is:

1. Bounded rationality-

   > *the meaning of rationality in situations where the complexity of the environment is immensely greater than the computational powers of the adaptive system* (Simon, 1969, pg. 166);

2. Data for planning-forecasting, prediction and feedback control;

3. Identification of the client;

4. Organisation in social design;

5. Management of time and space;

6. Designing without a final goal.

In the book *Science of Artificial* the ideas and tools related to technologies of managing are there, but still at the embryonic state, while they are more developed in the article *Bounded Rationality and Organisational Learning* Simon (1991). Simon suggests that for organisations, it is important to specify where a particular knowledge is stored, who has learnt it, and how has acquired it and how to convey information

> *Roles tell organisation members how to reason about the problems and decisions that face them: where to look for appropriate and legitimate information premises and goals (evaluative) premises, and what techniques to use in processing these premises. The fact that behaviour is structured in roles says nothing, one way or the other, about how flexible or inflexible it is. Each of the other roles that surround it and interact with it. Thus, the organisation is a role system* (Simon, 1991, pg. 126-127).

This means that in order to manage an organisation to be efficient, effective, and producing value, the managers have to define clear roles and structures, and increase the role of the learning process in order to develop a better problem solving process.

2.2 Summary - First Perspective: Design as rational decision making

Design definition	Design is the science of the decision making process, and the product is the decision, whether it is about the strategy of the firm or the design of a consumer product. It is the transformation of existing conditions into preferred ones: and fundamentally a process of problem solving
Design process	The rational decision making is based on selecting an alternative. The decision making process is split into steps (the identification and listing of all the alternatives, the determination of all the consequences resulting from each of the alternatives, the comparison of the accuracy and efficiency of each of these sets of consequences)
Role of Designers	Designers plan determined courses of actions or artefacts; not necessarily to realise them. Designers are creative persons, with different creative competencies, working in a wide variety of professions
Role of Management	Managers create and develop a favourable decision making process environment, and they have a limited cognitive capacity for reasoning when searching for a solution within a problem space
Value Creation	Value emerges in the process of reduction to declarative logic, in the domain of the optimisation methods
Technologies of management	The technologies of management allow for the recognition of what is inside and what is outside the systems, in the retain choice- design- action schema
Principal Authors	Simon (1969)

Table 2.2. Summary of the characteristics. First perspective on Design Management.

2.3 Second Perspective: New Product Development Process in Industrial Design

2.3.1 Design definition

The authors in this perspective have aimed at dignifying the discipline of design management, anchoring their arguments on Simon's book, clarifying that design is not simply an aesthetic add-on or an ornament, but it also produces value and is a driver for innovating and for producing value (Walsh et al. (1992), Cooper et al. (2003) Veryzer (1993)). Aligned with this view, Heskett wrote:

> *one of the most curious features of modern world is the manner in which design has been widely transformed into something banal and inconsequential. In contrast, I want to argue that, if considered seriously and used responsibly, design should be the crucial anvil on which the human environment, in all its details, is shaped and constructed for the betterment and delight of all* (Heskett, 2005, pg. 1).

In the broadest term, design is defined as an activity that is meant to give form and order to life's processes (Ulrich, 2011). Design is both referred to as an activity (the process) or as the outcome of the activity. Borja de Mozota (2003) suggests defining design by looking at the etymology of the word. Design comes from the Latin *designare*, which is translated in English both as design and as to draw. The noun design, in English, has retained its dual meaning: one the one hand a plan, a project, an intention, a process or a sketch, a model, a motive, a decor, a visual composition, a style:

> *the conception for the completed form of an object, often a sketch, model, or set of instructions that is a preliminary stage in the process that leads to a finished product* (Raizman, 2004);

on the other hand, the word indicates a process, putting the emphasis on the notions of creativity, constancy, quality and forms. In the sense of drawing, it signifies the achievement of a plan. For this reason, the design is defined in this perspective as *Design= Intention+drawing* (Borja de Mozota, 2003). This equation clarifies the point that design always presupposes an intention, a plan or an objective, particularly in the analytical and creative phases, as well as the drawing, model or sketch in the execution phase to give form to an idea. Design is a process through which technological ability is focused

on customer needs in terms of performance, human factors, appearance, and value for money (Hertenstein and Platt, 1997, Jun, 2008, Walsh et al., 1992). The design activities that are included in design, according to the British Council [1], are applied arts, architecture, fashion design, game design, graphic design, industrial design, interaction design, interior design, product design, process design, engineering design, instructional design, web design or service design. Deriving from these activities, design is often used as a word to describe the outcomes, such as lamps, fashion, furnitures, or white goods. Since this was how design was defined in daily language, and how it was perceived by stakeholders, there was an important effort in the 1990s to define its complex faces.
Walsh et al. (1988) have visualised the different definition of design and how they are related:

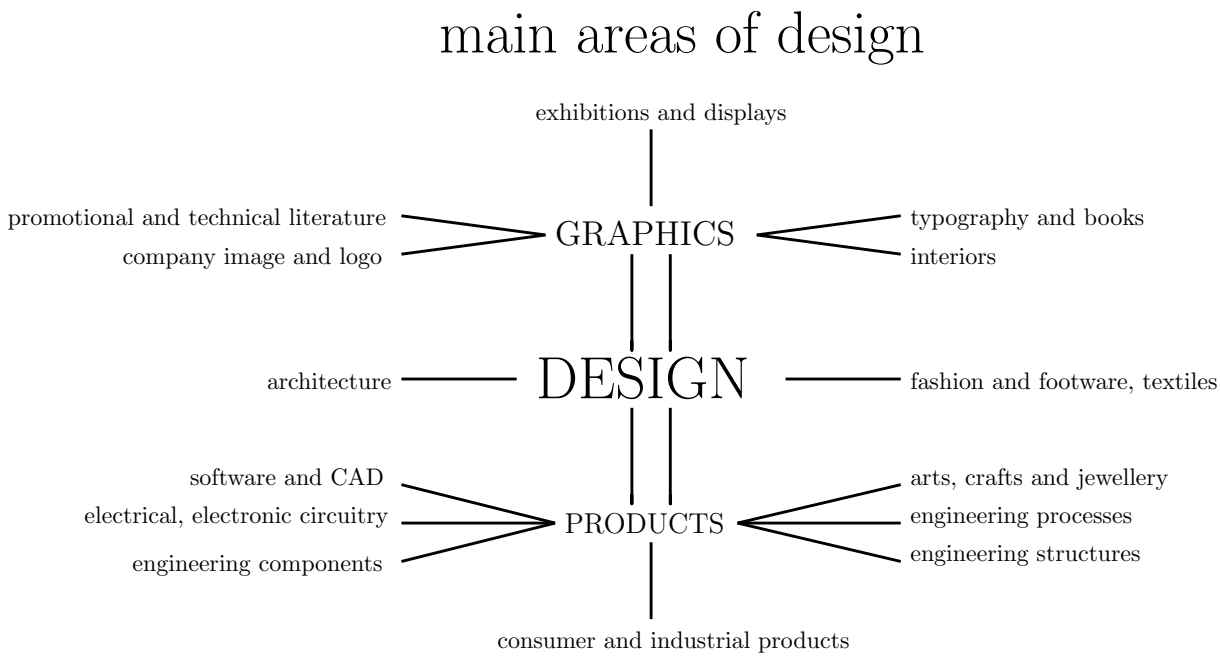

Figure 2.3. Main areas of design; source: Walsh et al. (1988) pg. 203.

Within this perspective, the notion of industrial design is the one that serves to represent the word design in the papers:

> *Industrial design is one of several key areas critical to new product development, together with research and development (R&D), marketing, manufacturing, and purchasing, among others. Industrial design contributes to new product development (NPD) by enhancing customer interface with the product, including ease of use, capabilities, and appearance* (Hertenstein et al., 2005, pg. 4).

[1] http://www.designcouncil.org.uk, check on date 06/08/2012

Industrial design is defined as

> *the professional service of creating and developing concepts and specifications that optimise the function, value and appearance and systems for the mutual benefit of both user and manufacturer* (Borja de Mozota, 2003, pg. 3)

and as

> *a creative activity whose aim is to determine the formal qualities of objects produced by industry. These formal qualities are not only the external features but are principally those structural and functional relationships which convert a system to a coherent unity both from the point of view of the producer and the user. Industrial design extends to embrace all the aspects of human environment, which are conditioned by industrial production* [2].

Therefore, design is a creative activity meant to contrive, formulate, project, draw, plan, sketch out, or apply to a particular purpose in order to establish multiple features of objects, processes, and services during their whole life cycle. But design is also about planning, scheming, arranging forms and colours; it is intended as a tool for product development and innovation managers to develop new products, to increase innovation and to make the company more profitable by presenting superior value for the product(Randall et al., 2005), by conceiving, designing, and establishing dependencies between design spaces, and their scope/complexity (Baldwin et al., 2006, Chiva-Gomez, 2004, Cooper et al., 2003). Design is also intended as a way to humanise technologies (Borja de Mozota, 2003), intricacies or to ease construction, address issues of use such as durability, efficiency, or convenience, and to consider the exploration and transformation of materials and the relative complexity or simplicity of the arrangement of forms (Raizman, 2004). Product design is defined as the choice and the configuration of elements, materials and components that give the product particular attributes of performance, appearance, easy of use and method (Roy, 1997). Through design, it is possible to assess the structural, organisational, functional and economical relationships among the different components of the product and the value chain (Borja de Mozota, 1998), to enhance the sustainability, ameliorate the living conditions of human beings, create values and meanings (Kristensen, 2004) and support local identities despite the globalisation (Borja de Mozota, 1998). Walsh et al. (1992) sustain that design is

[2] from the website http://www.icsid.org/about/about/articles33.htm

befitting not only the companies that are using it, but also increases countries' economic competitiveness. However, the benefits are hidden and need to be extrapolated, since industrial design is factored into R&D budgets, patents, or band names, but this makes it very hard to calculate the impact that design actually has on competitiveness. To support their thesis, the authors explain how Scandinavia could reach a sustainable design policy through a political involvement to sustain industries that invested in design to develop a competitive advantage (Walsh et al., 1988). The papers are classified in this perspective, describing design as a combination of science and art, mixing the logic that is proper to the scientific approach, with the intuition and creativity that are mostly used during the creative endeavour. Borja de Mozota (2003) suggests that stakeholders consider design not only an aesthetic add on, but also a tool to gain market shares, for the art of innovation. Design as an output is influenced by the strategic business goals generated by the company' s vision and corporate identity (Bruce and Bessant, 2002, Hertenstein and Platt, 1997). The authors in this perspective argue that product design is a crucial and fundamental aspect of the innovation process and new product development (Aubert, 1982, Chiva-Gómez et al., 2004, Dumas and Mintzberg, 1991, Jenkins et al., 1997, Walsh, 1996a). Combining the different nuances of the various definitions and the efforts to make it a coherent set of knowledge, industrial design can be intended as product design, the process through which a product is developed taking into consideration specifications concerning function, use, manufacture and communication (Dumas and Mintzberg, 1991).

2.3.2 The design process

Design process is a problem- solving activity (Borja de Mozota, 2003, Dumas and Mintzberg, 1989, Perks et al., 2005, Ulrich, 2011); it is the process of decision making and designing space. By designing decisions, the process creates a need for subsequent decision and becomes a space bounded by prior decisions. It is considered to be a problem- solving, creative, systematic, cultural, and artistic activity (Borja de Mozota, 2003). Design is translated in the process of creative problem solving activity that has to be coordinated.

> *Design, therefore, is a process of creation and decision making. It is not a substitute for other activities. Rather, it supports other activities and partners creatively with the field of marketing, endeavouring to strengthen and broaden its techniques and capabilities* (Borja de Mozota, 2003, pg.5).

In this perspective, design is intended as an activity for the transforming requirements, functions, needs and goals into concepts and specifications for implementing and producing the product (Visser, 2006). Design process is also a description of intentions, goals, and aims that are manufacturable and that other people can see, touch or hear (Gorb, 1986, 1995). The authors agree that the design process has different phases, based on the stage-gate model developed by Cooper (1990) (Borja de Mozota, 2003, Cooper et al., 2003, Perks et al., 2005). Design as a process is creative, complex (as involves a large number of variables and parameters), balanced (as it necessitate to make a compromise between multiple conflicting elements), it constantly requires to make decisions (Borja de Mozota, 2003) and to be functional across the organisation (Perks et al., 2005). Design as a process can be grouped into three main phases, according to the stage-gate system (Cooper et al., 2003). The first phase is planning (idea development analysis, market trends, feasibility assessment, development of the brief), then developing (where specifications, prototypes, detailed design and productions issues are considered), followed by launching (productions and sales phase). These phases tend to be similar in all the industries using industrial design (Borja de Mozota, 2003). The product development proceeds in a linear way (in the sense defined by Christiansen and Varnes (2007)) based on structured design and innovation models (Cooper, 1990, Kumar and Wellbrock, 2009). This model involves an analytical identification of customer needs, definition of product specifications, development, generation, selection, testing of the concept, and building of the product architecture, prototyping and finally launching it in the market. Design is considered critical in each phase but especially at the first gates, when it is considered as a

> *part of a problem solving activity beginning with a perception of a gap in the user experience, leading to a plan for a new, and resulting in the production of that artefact* (Ulrich, 2011, pg. 5).

In the Stage-Gate system the process for developing and launching new products is a funnel, in which the idea goes through to become a product (Cooper et al., 2003). In the design process, the problem solving activity turns ideas into plans, and, starting from the user experience, the design

process is aimed at sensing a gap, defining the problem, exploring alternatives, selecting a plan and delivering the plan (Ulrich, 2011). The idea for the product, once developed, moves through the funnel, and it has to have the criteria described in the different stages in order to be approved and move to the next step, as each phase has a set of go/kill points, at which the projects that do not meet the requirement must be killed (Cooper, 1990). Gates are meetings in which the managers are supposed to take decisions (Cooper, 1990). However, stages and gates are interpreted as reflexive practice, not only as obligatory passages, but as checklists and guidelines to overcome the difficulties and make decisions (Christiansen and Varnes, 2009). As opposed to the product development system, the design process has the goal of creating a visual output in each phase. The main stages for the new product development process are represented in the following figure:

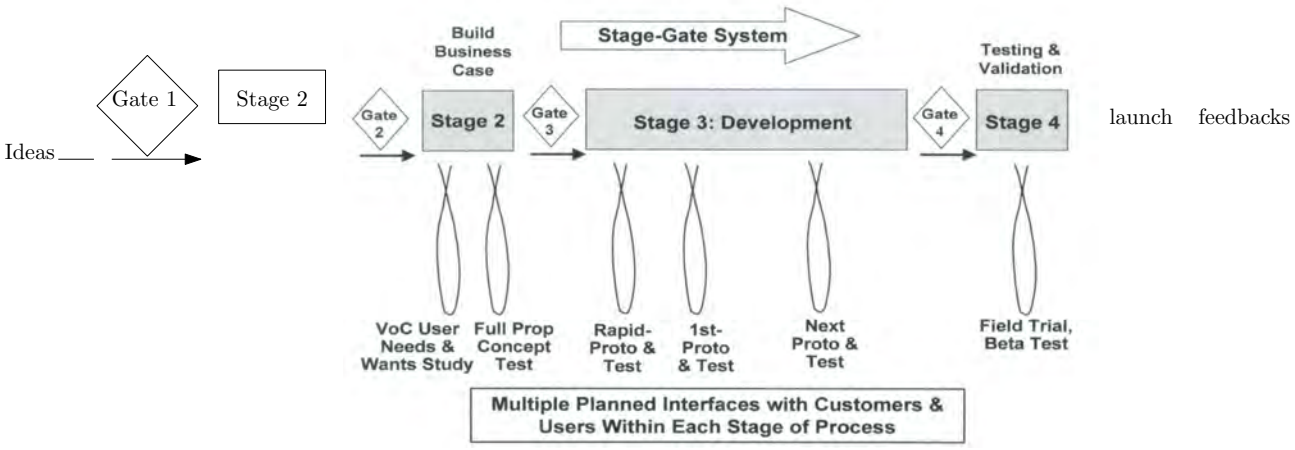

Figure 2.4. Flexible stage-gate model in (Cooper, 2008, pg 225), Spiral Development is a Series of "Build-Test-Feedback-Revise" Iterations or Loops.

This stage-gate model is more rapid compared to the traditional stage-gate model, because is based on rapid prototyping in order to assess the decisions (Cooper et al., 2003). The design process within the stage-gate model is essentially experimental and it produces sketches, drawings, specifications and models for a more rapid and flexible decision making process. In the discovery stage, companies look for customers' problems to be solved or unmet needs to be satisfied, and if the problem can be solved by design, then it turns into a design concept to identify the gap, the technology used and looking at the competitors' offers (Jun, 2008).
The process starts with the phase in which the designer senses the gap, defines the problem and then searches for solutions, looking also at the involvement of external groups (Kumar and Wellbrock, 2009, Swan et al., 2005,

Ulrich, 2011, 2006, Ulrich and Ellison, 2005, Von Hippel, 1988). This perspective is focusing on identification of user-needs, market research and technology scouting, to construct an appropriate concept to meet the required specifications.
After this, the designer is involved actively in the the research phase, during which he looks at the brief to identify problems, objectives of the design project, and people to work with Borja de Mozota (2003).

Once the responsibilities and the roles inside the team are defined, the exploration phase starts, and the designer presents some pre-sketches of various alternatives (Borja de Mozota, 2003).

If the sketches are approved, the project moves into the development stage, and the designer, along with the managerial team look at the feasibility of the project (Cooper, 2008).

In the next stage, the management discusses the project approval, prepares the business case, and in the gate 3, the decisions on the product's release are discussed on the basis of a scorecard, built on tools used for ranking the products (Cooper and Edgett, 2008b).

Once the product is created and launched in the market, designers become part of the marketing plan and communication platform (Walsh, 1996b). Managers should have a scorecard that would assess the design, and based on that, they can make decisions reflecting on:

- Strategic fit (Dumas and Mintzberg, 1991, Hertenstein and Platt, 1997): alignment of project to the strategy, importance of project to the strategy, impact on business

  > *the design of a new product is a statement of a goal for a firm. As such, it is much more than product design. The product will tend to define the relationships of the business with the outside world. It will give the shape of its market. The design of a new product, and the decision to manufacture it, will therefore be a declaration of intentions -strategic intention. This is often how competitors perceive it. It is, therefore, of paramount importance that the process of innovation and design be consistent with strategic intent* (DeBresson and Lampel, 1985, pg. 171-172).

- Product and competitive advantage (Hertenstein and Platt, 1997): the product delivers unique customer or user benefits; products offer customer/ user excellent value for money; compelling value propositions;

differentiated product in the eyes of customer/ user; positive customers/ users feedback on product concept.

- Market attractiveness (Person et al., 2008): market size; market growth and future potential; margins earned by players on this market; competitiveness: how tough and intense the competition is.

- Core competencies leverage (Chiva and Alegre, 2009, Chiva-Gómez et al., 2004): project leverage; our core competencies and strengths in the field of technology; production/ operations; marketing; distribution and sales force.

- Technical feasibility (Jun, 2008): size of technical gap; technical complexity; familiarity with technology of our business; technical results to date.

- Financial reward versus risk (Hertenstein et al., 2005): size of financial opportunity; financial return; product index; certainty of financial estimates; level of risk and ability to address risks.

Parallel with that, the designer is checking the technical aspects, including testing the norms of usage, the security, the durability, and the calculability of the production's program. Managers, based on the informations received at the gates/meetings, screen the financial and business characteristics and make an analysis before development begins (Cooper and Edgett, 2008a). However, this vision is too rigid, and does not take into consideration the different environments in which the design can be used. Already at the beginning of the introduction of the stage- gate model, there were some uncertainties regarding the success of the process. The process is successful and the outcome certain if the preliminary market assessment (to determine market size and potential, customer interest, initial insights into customer needs, requirements, value, and the competitive situation), the technical assessment (assessment of the technical challenge), the source-of-supply assessment (an evaluation of source of product supply), the market research (in-depth market investigation), the concept testing (the concept or virtual prototype is presented to customers to receive feedback), the customer assessment (a value-in-use analysis, to assess the product's value), the product definition (the project team integrates the acquired information into a product definition, including the project scope, target market, product concept, benefits and value proposition, target price and positioning), the business and financial analysis, and the marketing plan for launching in the market are defined (Cooper and Edgett, 2008a). However, the stage-gate model is a standard

tool applied in different contexts (Cooper et al., 2003). Distancing himself from this categoric definition, Holt (1990) identifies three nuances of design processes. The first one is an analytical process, that is used when the uncertainty and the risk is fairly low; the second is an interactive design process, that is preferred for medium risk projects and for radical innovation; the last one is a visionary design process in which the project is undefined and vague, so the designer assumes a larger risk and the brief remains very flexible in order to be adjusted when problematics arise. Hence, the new product development process can include different possibilities of use of design process (Perks et al., 2005), even if in the majority of papers are considered incremental innovation, because they foster the creation of a form, of an artefact invoking unity between structural, functional and symbolic constraints (Borja de Mozota, 2003, pg.20). Therefore, a creative activity is based on a good planning process. The design is an innovative, multidisciplinary and interactive process, mixing internal and external factors, and thus it is the factor that can contribute to delivering a superior NDP process for the company that is reflected in a superior product for the customers. The creative design process of the NPD using design has a multidisciplinary and interactive character (Whyte et al., 2003). The design process is supported by complementary design activities such as branding, marketing, interactive websites, customers and employees feedback, integration of design sales, customisation of products, team based work, and managing external collaboration (Jun, 2008, Whyte et al., 2003).

2.3.3 The role of designers

Industrial designers are among the several persons that participate in NPD. They are professionals that are able to work in multifunctional teams (composed by people from engineering, manufacturing, and marketing) (Perks et al., 2005).

> *More specifically, industrial designers focus on improving customer ease of product use and their graphic and aesthetic capabilities help to differentiate competitive product offerings and attract customers. These activities together with successful marketing campaigns enhance for customers the perceived product value, which in turn strengthens demand and/or justifies a relatively higher selling price, thus increasing sales revenue (sales)* (Hertenstein et al., 2005, pg.5-6).

The designer is a creative and artistic person that is working on developing a product or a service, acting as a coordinator (Borja de Mozota, 2003), harmonising the variegated components present in a project, and he/she acts as gatekeeper or integrator of the customers' needs (Bruce and Daly, 2007, Leonard-Barton, 1992). The designer usually has characteristics of project manager and conflict manager, but also

> *an innovator and a trend setter who tries to initiate change, to make a leap of imagination, and to produce an idea. He considers the world a reality to be interpreted* (Borja de Mozota, 2003, pg. 4).

Designers are expected to meet the constraints that are given by managers, such as product costs, development process costs and time to develop (Hertenstein and Platt, 1997), to come out with a synthesis represented by the product or service (Cooper et al., 2003). Designers are frequently asked to become active in managing the innovation process, by applying new ideas in practice of the form of new or improved products, services or processes (Bruce and Bessant, 2002). In the projects, designers are expected to coordinate different roles and interpret the given instructions, including human values over the technological constraints (Bruce and Jevnaker, 1998, Jun, 2008). The designers are a source of different skills and knowledge, able to integrate with their expertise and relation networks the different actors, contributing to the competitive advantage of the firm (Twigg, 1998). The following list is a resonate collection of papers and books belonging to this perspective, which delineate the profile of the designer:

> possessing design skills; able to manage the design process; able to visualise products and services; risk taking; creative; able to use different materials; constantly researching for new solutions; original; possessing commercial skills; able to visualise the markets and understanding the needs; able to analyse and anticipate future trends; capable of building different scenarios; proactive in developing relationships; having a commercial vision; able to manage uncertainty; good at presenting and persuading through prototype and iteration; good at synthesising; able to understand and balance stakeholders requirements; possessing intuitive thinking and action; stiving for elegance;

These characteristics lead to delineate that the designers are catalysers, creative persons able to lead to the generation of novel ideas, with the ability

of combining ideas in new ways to solve problems and exploit opportunities, and to find modalities for changing patterns of consumption, taste and commercial imperatives. They purposively use design to increase creativity throughout the process of innovation, which entails combining function with materials to increase the efficiency of the production and combining style with appearance to increase the appeal of the products in the eyes of customers. Designers are expected to create something that has as an aesthetic output, functionality, reliability, and cost cutting, result of a process that translates ideas, opportunities or triggers something through the consistent deployment of creativity, extrapolating input from different parts of the organisation, from the market and from observing the customers (Bruce and Bessant, 2002, Bruce and Jevnaker, 1998). They are problem solvers, generators of potential solutions and translators of ideas about new products into sketches or prototypes, moderating a dialogue and enabling others to visualise the product and start a discussion its possibilities. They are knowledge brokers and, through their creativity and bridging knowledge from one field to another, they are able to create radically new products (Hargadon and Sutton, 1997, 2000). Designers are the initiators of a process that is bringing to the synthesis of the project by concretising and materialising the solution (Ulrich, 2011). By being attentive to the aesthetics of the product (Person et al., 2008) and by creating a form that produces an artefact eliciting unity between structural, functional and symbolic constraints (Lam et al., 2006, Ulrich, 2011, 2006), they work at a multifunctional level in a synoptic way, considering the project as a plurality of factors. The designers act also as craftspersons by applying a distinct skill set to the task to develop a brief (Platt, 1996, Ryd, 2004). The designers can drive a company towards a more sustainable policy, by using recyclable and compatible materials, avoiding toxic materials, maximising use of all materials through recycling and reuse, minimising the number of parts and the disassembly surface, considering the raw materials used and the impact then of the product after it has terminated its life cycle, and maximising the modularity of the product development (Borja de Mozota, 2003). Finally, designers are in the category of the *creative class* (Florida, 2004), people that engage in works whose functions are to create meaningful new forms, contributing to the economic growth.

2.3.4 The role of management

Both managers and designers are asked to perform design as an activity primarily concerned with problem solving. The managers have the function

of defining a design problem, looking for the most suitable designers able to solve it within the budget and time constraints that are decided by the manager (Farr, 1965). They have to use tools and technologies of managing to facilitate the innovation process smoothly and successfully (Walsh et al., 1992), involving various stakeholders in the design and new product development process (Gorb, 1986). The managers ensure a simplification process, embedding and managing priorities from different projects, balancing the offer and the demand, planning the product development process based on the dimension, maturity, and organisation structure. This simplified process can ensure creativity and the ability to deconstruct and reconstruct continuously the environment in which they are ducked. Managers have to make decisions (Bruce and Bessant, 2002, Cooper et al., 2003, Dumas and Mintzberg, 1991, Walsh, 1996a), create an organisational context that abets the design process, and manage the human resources that are involved in the design process (Topalian, 1980). Managers decide on how to position the company within the design process (Hertenstein and Platt, 1997) and determine whether it can be internalised or externalised, depending on the presence or absence of middle managers and designers at the firm. In the studies, the solutions adopted are contingent with the market conditions and with the product developed (Cooper et al., 2003).

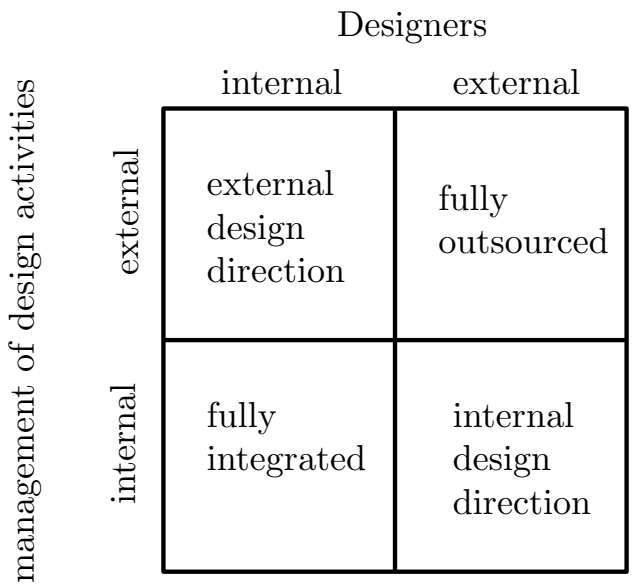

Figure 2.5. Matrix of design possibilities; matrix with different design possibilities for design activities, inspired by Bruce and Morris (1994), Chiva-Gómez et al. (2004).

The matrix visualises four different possibilities that managers can have for choosing the design process for their company, based on the theory of Armour and Teece (1980). If the company has an internal division dedicated to design management, then the company can either allocate the designers

in multidisciplinary teams (Cooper et al., 2003), making the design activities fully integrated, or it can allocate the designers to different functions, such as R&D, production or marketing (external design direction). Otherwise, if the company does not have a dedicated design division, it hires a consulting group to develop the design functions, opting for a fully outsourced function. In this case, the design consultancy brings along its network of design experts (Cooper et al., 2003), and the managers are responsible for the NPD, brokering, connecting and evaluating the external designers (Bruce and Morris, 1994). If the company has some designers involved in the product development process, but they lack managerial competencies, then the company can decide to hire a consultant and proceed with the product development process. The external design professionists are brought in to supply additional resources to ensure that the project is completed on time, to supply fresh ideas, or to provide a specific expertise. When the design comprises a mixture of in-house and external design skills and management decisions, the decisions on when to outsource the competencies are based on the markets' level of the technology of the products, and on the decisions concerning brand image (Jun, 2008). The decisions regarding internal or external also depends on the cost structure of the company (fixed costs if the designer is internal, variable if he/she is hired temporarily). Furthermore, the decisions on which of four strategies to adopt are based on the firm's availability of a person responsible for implementing decisions, training personnel, and developing new product using design (Press, 1995), on the strategic positioning of the firm and the design integration in the company' s value chain (Porter, 1985). Managers are also in charge of building the external relationships that are crucial to the design environment, especially for having connections with other designers, design schools, clients, museums, award competitions, and and any other intermediary that can influence the success of the relationships, design consultancies, retails chain stores, and manufacturers (Borja de Mozota, 2003). The management of the company should seek for a competitive advantage by coordinating the network in which they are embedded considering each relationship part of the design chain (Twigg, 1998).

The design decisions have a side effect on competitiveness, prices, margins, and other factors that can influence the performance of a product, such as originality, appearance, finish, reliability, durability and security, presentation, packaging, delivery (Rothwell and Gardiner, 1983, Roy, 1990, Walsh et al., 1992) and the semantic product value (Paul and Fricke, 1999). Design firms have better results in terms of sales growth and profit rate (Chiva and Alegre, 2009, Chiva-Gómez et al., 2004). According to the literature, a manager should have the following skills:

1. Basic skill

   > *to design high quality, manufacturability, and low cost into products and to ensure new products are designed and launched faster*(Chiva and Alegre, 2009, pg. 426);

2. Specialised skills, that are directed at cost estimation in the NPD, using the computer-aided design tools effectively, and testing manufacturability of new products (Chiva and Alegre, 2009, 426);

3. Social skills, that are used to involve others, including customers, suppliers, manufacturing companies (Bruce and Daly, 2007, Chiva and Alegre, 2009, Platt, 1996, Twigg, 1998, pg.426);

4. Organisational change, that is the ability to manage change and unforeseen situations (Chiva and Alegre, 2009, pg. 426);

5. Innovation skills (Chiva and Alegre, 2009, pg. 426).

Managers are required to organise the integration of design in the corporate structure at the operational, organisational and strategic level, as well as to manage the formal design system, composed of information systems, documents, environments, products and services that have their own unique aesthetic qualities, in order to integrate different functions. Therefore, managers should have knowledge in different areas, including marketing, business and intellectual property, conflict negotiation, communication, design operations management, new product development, financial reports and analysis, different forms of financing, business strategy, business planning and design management case studies (Borja de Mozota, 2003). Therefore,

> *managers are designers in this regard because of their concern with the fit of product with context, the fit act odd different forms of design expertise, and the fit of product as well* (Dumas and Mintzberg, 1991, pg. 30)

Based on design experience, the manager' s decision-making model turns out to be more intuitive, increases the observation capabilities, and highlights the human dimension. Design and management converge in the manager's cognitive system, turning the decision making process into an investigative and experiential, and requires the learning of how to be a facilitator for the integration of design in the organisation (Borja de Mozota, 2003). In table 2.3, inspired by Borja de Mozota (2003), the key competences that design managers should have according to the characteristic of design that need to be managed are summarised in the next table.

DESIGN CHARACTERISTICS	ROLE OF MANAGERS
Design is a problem solving activity	Managers have to organise the process and be good at problem-solving activities
Design is a creative activity	Managers have to a manage ideas and innovation
Design is a systemic activity	Managers should facilitate the creation of a communication structure and encourage the activities of knowledge sharing and knowledge brokering
Design is an activity of coordination	Managers should create a communication structure, facilitating knowledge sharing and knowledge brokering
Design is a cultural and artistic activity	Managers have to understand which are the consumers' preference in order to deliver a product that satisfies them and is aligned with the organisational culture and reflect its identity

Table 2.3. Role of design managers Design characteristics at the firm and actions that managers have to focus.

2.3.5 Value creation

The value consists in having a product which is stylish, aesthetic, of high quality, attentive to the customers' needs and that consequently enhances the company's reputation. Value creation refers both to value delivered to the customers and to value created for the company. As such, value is considered both in economic terms and customer satisfaction. Value is recognised for providing sustainable competitive advantage to the firms that are adopting a design oriented strategy for NPD (Kotler, 2009, Kotler and Rath, 1984). For the company, design is innovation that can add value by creating a superior product through an attentive research of what is needed on the market and delivering high- performance products and service equipped with technological sophistication and innovation by using internalised customers' information (Borja de Mozota, 2003). Hertenstein et al. (2005) conducted a study to quantify the value that design produces to create sustainable competitive advantages. This study added to a previous study conducted by the researchers (Hertenstein and Platt, 1997), in which they selected 43 different variables to measure design performance in order to quantify the value that design produces (economic value, added value, and percentage of sales and economic value, customer satisfaction, innovation, and creativity).

> *A firm' s value chain is an interdependent system or network of activities connected by linkages into which design has to penetrate*
> (Borja de Mozota, 1998, pg. 28)

Borja de Mozota (1998) analyses the strategic value chain developed by Porter (1985) that integrates design into the activities of the firm, including primary activities (production, marketing, delivery, and servicing of the

product), support activities (inputs, technology, human resources, infrastructures), and activities that support the value system of the industry (tasks that relate mainly to the distributors and suppliers). Design affects them on three different strategic levels: operational design (design creates customer value by proposing differentiated products and proposing a corporate image), functional design (design creates value for the company, such as design interface with other functions), and anticipative design (design creates a vision for the entire value- chain). According to Borja de Mozota (2003), what produces value for customers is the product differentiation, that, if appreciated, becomes loyalty of a brand (Pullman and Gross, 2004) for the customers. Marketing is considered the organisational function through which value is delivered to the consumers. For this reason, in Borja de Mozota (2003), marketing is considered an exchange process aimed at creating value. Design can not only facilitate, but also augment the value in the exchange process between two parties that give and receive a product, a service, or an idea. Walsh et al. (1988) argue that design plays a role in the competition, influencing factors that create value, which also have an impact on the price. The price factors are sales prices (including making it cheaper for manufacturing) and life cycle costs (taking into consideration costs of use and maintenance). The non price factors are product specification and quality (product performance, uniqueness, appearance, materials, finish, reliability, durability, safety and how easy is it to use), company image and sales promotion (product presentation, packaging, display), delivery on time, and after sales service (if the product is designed for ease of service and repair)(O' Donnell and Duffy, 2002).

> *Good design, by imparting quality, may increase value for money and customer demand. Commercial success, therefore, depends on the whole chain of causation, design- quality- value for money. But the links in the chain themselves depend on other elements. They depend on management skills, co-ordinating design activities with other tasks in the firm particularly marketing, manufacturing and finance, and ensuring the provision of comprehensive design briefs. They depend on good long term contact with customers and suppliers, often involving their participation in the development and prototype testing processes, and constant awareness of what competitors are offering. They depend on a high priority being given in corporate strategy to multiple objectives, notably excellence in design, satisfaction of customers and meeting financial goals with a systems approach to planning, in-*

corporating these and other elements (Walsh et al., 1988, pg 215).

Marketing is the organisational function through which the value creation process is communicated by conveying brand values (Jun, 2008) by means of products, packaging, corporate identity, advertising and environments, by enhancing product and service quality, differentiating products and services, enhancing company image, lowering production and maintenance costs and adding the creativity, and intellectual property (Bruce and Daly, 2007). Design can create value for the firm by minimising investment, exploiting economies of scale, and preserving organisational focus, maximising product performance with respect to customers' requirements, minimising the size and mass of a product, and minimising the variable costs of production (Ulrich and Ellison, 1999). When these benefits are competitively important, firms will design product-specific components. Since design can be defined as

> *the human capacity to shape and make our environment in ways, without precedent in nature, that serves our needs and gives meaning to our lives* (Heskett, 2005, pg.2),

it is translated in Kristensen et al. (2012), as the foundation of value, branding and storytelling that add value to the product.
Gabrielsen et al. (2010), Kristensen et al. (2012) argue that design can add value to the brand, and the effects of the perception of the design on the customers are greater if they are reinforced and supported by good branding, labelling, or relevant concrete information pertaining to the design. Moreover, design can help the exchange process between the firm and the customers, in which both parties give something for the value to satisfy their perceived needs (Borja de Mozota, 2003, Borja de Mozota and Clipson, 2011). Value is also stimulating emotions, staging in the consumers' memory, leading to a sequence of links with the consumer's concept of self and their perception of benefits (Borja de Mozota and Clipson, 2011). According to Norman (2007), the value of design resides in the emotions that it is able to elicit, since objects are more than utilitarian. Their value depends on the occasion, contest, meaning that they are conveying, and on the beauty that is embedded. It depends on the usability, on the aesthetics and practicality (Norman, 2007, pg. 5). The products are designed to fit the task, and should be more effective across a wide range of users and uses (Ulrich, 2011). The value of design is to stimulate emotions and to make the decision making process more effective, passing judgments, presenting immediate information (Norman, 2007). Design is valuable because it creates emotions (short lasting),

stimulates moods (long lasting), traits and personality. Design has three different aspects, namely the visceral (concerns with appearances), behavioural (pleasure and effectiveness of use), and reflective (rationalisation and the intellectualisation of a product).

> *The visceral level is pre-consciousness, pre-though. This where appearance matters and first impressions are formed. Visceral design is about the initial impact of a product, about its appearance, touch and feel. The behavioural level is about use, about experience with a product. But experience itself has many facets: function, performance, and usability. A product' s function specifies what activities it supports, what it is meant to do- if the functions are inadequate or of no interest, the product is of little value(...) It is only the reflective level that consciousness and the highest levels of feeling, emotions, and cognition reside. It is only here that the full impact of both thought and emotions are experienced. The lower visceral and behavioural levels, there is only affect, but without interpretation or consciousness. Interpretation, understanding and reasoning come from the reflective level* (Norman, 2007, pg.36).

Products, in the author' s definition, do not have intrinsic value but they have value through the emotions experienced by the users and their emotional connections. What sustains the value of the product is emotional branding, intended as a function for building relationships, stimulating emotional responses, giving a brand and a product long term value (Norman, 2007). Value is created also when the design satisfies needs that the customers were not aware of. This should be sustained by a coherent marketing strategy, in which the entry in the market is done by diverting attention, proposing surprising novelty and the product goes beyond obvious needs and expectations, creating an instinctive response and has a story to be told (Norman, 2007). The authors of this perspective are basing their model for consumers' consumption on the theories developed by Bourdieu (1993), which define consumption as an activity that takes place in social structures. Consumption has an emotional implication on the purchase of the products, the product is bought to reinforce the ego and the idea of the self, and the idea of the self in a social group: the product indicates an affinity for a particular group (political, social, or religious), the interactions with other consumers in a social environment, and the global value of a service or product results from its social value as well as from its functional and symbolic values (Cova and Cova, 2001). The value of the good is in its ability to create social relations,

and this ability becomes more important than the goods per se, through an aestheticisation and an experience building, embedded in the product and in the design (Borja de Mozota, 2003, Cova and Cova, 2001). Therefore, the value of design resides in the capacity of the product to create a network of meanings, stories, and identities for the consumers. This relational value that customers perceive for the products is reverberated in the brand value, intended as a system of physical features, emotional and cultural associations (Borja de Mozota, 2003, Jun, 2008).

> *Brand is a means of injecting value into products in order to differentiate them from the competition. Therefore, in a relational perspective, brand status is determined by the way in which the company and its customer base appropriate the brand. Saying a brand has value sense three things:*
> *1. brand value is the result of interaction: a brand has positioning, promise, and network functions;*
> *2. a brand is a source of value that differs according to those who interact with it: consumers, producers, and distributors;*
> *3. brand value is a building over time, a sedimentation process, which evolves and changes: the brand has a mission to build customer fidelity and evoke a favourable response from the public.*
> (Borja de Mozota, 2003, pg.98)

2.3.6 Technologies of Managing

The technologies of managing are related to the understanding of the firm's performance and of the customers' needs for the creation a product that is suitable and the consolidation of the distribution and the commercialisation processes (Chiva-Gómez et al., 2004). The technologies of managing facilitate managers in having a strategic approach by examining informations to enhance the efficiency of management in general - and design management in particular. This requires an understanding of the ways in which technologies of managing are used to interpret reality, which are essentially relational and interpretative, in order to enhance business strategy and the company's vision (Borja de Mozota, 2003, Borja de Mozota and Clipson, 2011, Candi, 2010a,b, Chiva and Alegre, 2009, Cooper et al., 2003, Farr, 1965, Gerber and Carroll, 2012, Hargadon and Sutton, 1997, Ulrich, 2011, Walsh et al., 1992). The technologies of managing measure parameters and activities in the company to improve the management and the quality of the products and services delivered, for example by using tools for measuring design efficiency,

quality measurement criteria (such as the impact of design on quality objects like zero defect, zero inventory, and zero rely, on production defects), and for measuring the quality of partners, the selection of suppliers and customers satisfaction (Borja de Mozota, 2003).

Benchmarking It is a tool used for comparing different products offered by competitors or different products within the same company to increase the knowledge of a sector and increase the knowledge of the needs of the customers throughout the analysis and the confrontation of the existing products. Moreover, it can help to identify the stages of the specific indicators.

Blue Sky Research Through this technique, the design team is bridging and integrating stimuli and suggestions coming from different production contexts for the NPD.

Brainstorming

> *Customers are invited to a company "innovation day."As part of the day, attendees break out into teams with company people - marketing, sales and technical - intermingled. One team exercise is often a reverse or inverse brainstorming session, where the purpose is to rip apart the current products. Other breakout sessions include brainstorming or group creativity methods to yield possible solutions. This method is most appropriate for B2B products* (Cooper and Edgett, 2008a, pg. 51).

Brief The brief is defined as a core document including extensive and detailed information and objectives concerning strategy, product details, production, finance, and marketing (Bruce and Daly, 2007). The design brief is a flexible tool and it can be used in different ways, for instance as background information in which the designer is free to make his/her own interpretation, a simple annotation to be used as a springboard, or more strict with the guidelines decided by a product committee. The briefing document is used to discuss and agree on requirements, expectations and costings (Bruce and Daly, 2007, pg. 937).

Character portrait It is a tool used to describe the characteristics and the specificities of the targeted consumers, the cultural traits, the psychological and social profile to increase the knowledge of the ideal type of customer for evaluating the compatibility between different profiles of users.

Customer Journey It is the visualisation and the description of the journey that customers have when using the product, frequently happening in a virtual world (Fuller and Matzler, 2007).

Customer visits with in-depth interviews

> *The entire project team does face-to-face visitation and in-depth interviews with customers or users. In the case of business-to-business (B2B) markets, the visit team is usually three people - marketing, technical and sales - and the customer is often represented by a group as well. The interviews are set up by the sales force, and are based on a carefully crafted interview guide that probes for unmet needs, unarticulated problems, and functions and benefits sought—probing well beyond what is normal in just a casual conversation* (Cooper and Edgett, 2008a, pg. 51).

Design competition/tournament

> *Tournaments exploit large numbers of parallel searches by individuals, sometimes collecting design alternatives from thousands of entrants. This strategy can be particularly powerful when seeking new ideas for products in that a raw plan, perhaps only partially developed, can be selected from the efforts of many individuals and then refined professionally through common design by an institution. In this way, tournaments are a way of harnessing the value of independent exploration by user designers with the cost advantages of common design* (Ulrich, 2011, pg.66).

Design Grammar

> *A design grammar is a set of rules defining "valid" designs, including a definition of the elements of the design and the rules by which they may be configured. (A template is a very restrictive type of grammar in which the alternative selections of elements must always be configured in the same way.) ...A grammar defines a universe of valid designs. While it may enable efficient exploration, it also restricts the space of possibilities to the scope of the grammar. Consider the designs of Frank Gehry such as the MIT Stata Center (Exhibit 5-5). In the late twentieth century, Gehry's work appeared fresh precisely because it deviated*

from existing grammars, possibly the way the Queen Anne style appeared fresh in the late nineteenth century. Interestingly, over his career Gehry has designed enough buildings that one can start to imagine a formal grammar defining a valid "Gehry style. (Ulrich, 2011, pg.63-64)

Design Kits

Design kits are tools to facilitate the design process, often provided at no charge by firms seeking to produce the unique artefacts of designers, or who otherwise benefit from active design communities. Producers of specialised semiconductor devices will sometimes provide designers with "breadboard" systems incorporating the devices to enable experimentation and trial, and in the hopes that these devices will be used in a new artefact. Design kits reduce the fixed costs of designing a unique artefact and so enable expert design and user design (Ulrich, 2011, pg.66).

Ethnographic Research Ethnographic research is useful for identifying the uses, the customers and the cultural manifestations through the observations of the (potential) end users (Ulrich, 2011). Ethnographic research is considered a suitable tools for creating radical innovation, collecting informations on how customers use the products and the services, and understanding which are the hidden market needs Goffin et al. (2012). The tools used are contextual interviewing and systematic observation. The ethnographic market research can ensure the identification of the hidden market needs and the understanding of customer segments, a purpose that is hard to reach with focus groups and surveys (Goffin et al., 2012).

This method is essentially cultural anthropology, and involves camping out with users in their homes, offices or factories. Here the visit team is non-intrusive and spends most of their time observing customers use, abuse and misuse products as they go about their daily routine. An insightful research team gains a much better understanding of the customers' challenges and problems, and is thus in an excellent position to design the next great new product. This method sees many applications in consumer goods, but we also saw it effectively used to generate significant new products in B2B settings (Cooper and Edgett, 2008a, pg. 51).

Focus group

> *Customers and users are invited to a moderated roundtable discussion or focus group session, not to evaluate new concepts, but rather to articulate their problems and challenges. Understanding customer points of pain is often the starting point for developing a breakthrough solution. In some cases, the host company also has a group of design engineers watching the customer focus groups on closed-circuit TV; once a problem has been identified, the engineers quickly brainstorm and propose solutions, which are promptly tested on the focus group. After some iterations back and forth between the focus and brain-storming groups, an innovative solution often emerges. The methodology works with either B2B or consumer products* (Cooper and Edgett, 2008a, pg. 51).

Knowledge repository Useful for organising the material and the tacit knowledge owned by the people in the organisation, the information collected throughout the trend grasping research, with the aim of making it available to the persons working in the organisation, increasing the sharing, the circulation of information that is coming from different parts, and the participation of different actors. With this tool, managers encourage the exchange of knowledge and information, technical paradigms and standards, segmentation of different offers, the current trends, the characteristic of the customers, the dynamics, the modalities and the drivers of purchase and consumption.

Lead User Analysis Lead user is a marketing tool technique, used for developing new products, in which customers have an active role and they propose a product or a solution to a manufacturing company, select a supplier capable of producing the product, and send a request to the selected manufacturer. The manufacturer screens ideas (not needs) for new products and for selecting to develop those concepts which seem to offer the most promises from the manufacture's point of view (Von Hippel, 1978, pg. 40). The extensive review on user involvement for facilitating radical innovation (Janssen and Dankbaar, 2008) highlights that lead users are described in the literature as a breakthrough method for identifing the future needs of the market (Randall et al., 2005, 2007). Urban and Von Hippel (1988) and Von Hippel (1988) recognised external sources of useful knowledge where companies can find lead users that could be involved in the NPD, namely suppliers and customers university, government and private laboratories, competitors, and

other nations. In the recent papers, lead user method is considered a market research tool that could result in breakthrough products, created by identifying leading trends in the to-be-developed product's associated marketplace (Von Hippel, 2005). In the recent years, lead users have been described as people or organisations that are striving to solve a particularly demanding version of a stated problem, or proposing a solutions for a problem that will become relevant in the next months, because they feel the need and the urge to have it (Ulrich, 2011).

> *Your innovative customer has your next new product! In this method, the goal is to identify particularly innovative customers or users, those who are ahead of the wave. Working with them—for example, via a customer group meeting at an off-site event, you are bound to come up with innovative product designs and solutions* (Cooper and Edgett, 2008a, pg. 51).

Performance indicators Managers make decisions based on the received information by the company information system (Hertenstein and Platt, 1997). The following table explains different information that are provided to managers to make decisions in terms of design activities

Information	Differential	Influential	Antipicitative
INSIDE/ INSIDE	Production project Design process Design tasks Business data	Journal Meetings	
INSIDE/ OUTSIDE	Customer invoice Supplier order Distributor	Financial data Annual report Advertising Products brochure Corporate identity	Advanced design concept
OUTSIDE/ INSIDE	Supplier invoice Customer order Shareholders & bank	Client claims Sales reports Client surveys Image audits	Database press Technological watch Strategic scanning Design schools & competitions

Figure 2.6. Design management information system by (Borja de Mozota, 1998, pg. 29).

These tools help managers to make decisions, to be more efficient, and enable differentiation. Hertenstein et al. (2005) provide a conceptual framework for analysing the performance of a company, whose aim is to create value for the industrial design. In this framework, industrial design is translated into standard financial measures of firm performance (profit, cash flow, return on sales, return on assets), that reflect the stock market return.

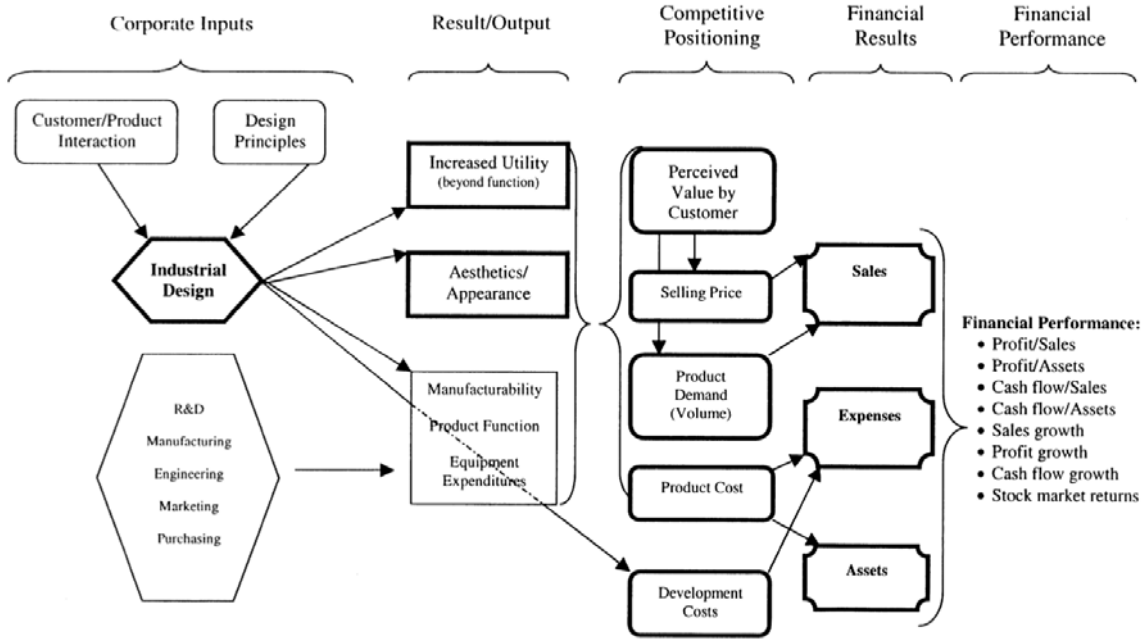

Figure 2.7. Conceptual mapping map about new product development by (Hertenstein et al., 2005, pg. 6).

Borja de Mozota and Clipson (2011) assert that companies endowing in industrial design are inclined to launch more profitable products:

> *profit increase is achieved not only by expanding sales or by a drop in manufacturing costs, but also by a drop in advertising costs* (Borja de Mozota and Clipson, 2011, pg.75).

The tools also help to overcome the limits that are linked to the traditional market research tools, increasing the strategic and relational vision of the functions within the company (marketing, NPD, manufacturing) by delivering an innovative product that meets the customers' needs (Borja de Mozota, 2003). Moreover, the tools are used for conveying information for understanding whether the product meets the internal strengths and technologies, if the customers perceive a differential advantage, if its performance is satisfactory, and whether the marketing inputs have a role in shaping the concept and the design of a product (Borja de Mozota, 2003).

Product Life Cycle (PLC) The product life cycle is described as a managerial tool for the selecting appropriate marketing actions and planning (De Bresson and Lampel, 1985). Levitt (1966) is the first researcher to introduce the concept of the PLC with the intent to create a predictive tool to help managers to make decisions about competitive moves, to forecast marketing requirements and to assist in the planning of long- term product

strategies before the last stage of the product life. The PLC is approximated by a bell-shaped curve (Rink and Swan, 1979) that measures the sales of a product; sales are defined as the total number of all consumer purchases of a specific product (Chandrasekaran and Tellis, 2011) from the time it is first placed on the market until it is removed (Rink and Swan, 1979). The model hypothesises that sales follow a sequence of stages, beginning with product introduction and proceeding with growth, through maturity, and eventually decline (Polli and Cook, 1969). One of the difficulties spotted by Rink and Swan (1979) is defining what is a new product, and if variations of established products represent a new product or part of one from which it derives. The PLC is divided into certain recognisable stages, namely the market development (when the product is firstly brought to the market), market growth (the demand accelerates), market maturity (demand level' s stops growing) and market decline (Levitt, 1966, pg. 19-20). The theoretical framework behind the PLC is the theory of diffusion (Rogers, 1995). The PLC is a description of the most probable pattern over time for the sales of a product, but it does not explain the qualitative changes in the curve (Eger and Drukker, 2010). It is considered useful to interpret the sales by understanding in which position on the PLC the products is, according to which managers can decide on the next competitive move (Levitt, 1966). Managers are using these data to make decisions about investments in further product development or research process, advertising and promotion (Golder and Tellis, 1997). These decisions are planned with consideration to the sales and external factors, such as a sequence of conditional moves, taking into account the competitors, uses and different users, by adopting the right mix of promotion and advertising to increase the duration of the different phases, and to revitalise the sales once they start to decline, or eventually to decree the death of the product. DeBresson and Lampel (1985) warn against relying too heavily on life cycle curves, as they represent an accumulation of a diversity of information and complex relationships. In some cases, instead of decline and withdrawal from the market, there is the possibility to have product petrification (Michael, 1971). The product' s sales and profit curves do not stop, but continue in time; compared to the declining stage, the decline is slower than the profit margins (Michael, 1971). For the product petrification stage, there is little to be gained from further increase in advertising, packaging, quality, or service. The active price competition of previous stages has led to a low price, and, as substitute products would probably be presented with higher price, increases in price may be possible (Michael, 1971, pg. 90). Another common deviation is the saddle (Chandrasekaran and Tellis, 2011)

> *saddle is a sudden, sustained, and deep drop in sales of a new product, after a period of rapid growth following takeoff, followed by a gradual recovery to the former peak*s (Chandrasekaran and Tellis, 2011, pg.21).

The saddle is characterised by a point at which the saddle starts (the first year of decreasing sales), and a point where the saddle ends (the first year in which the sales cross the prior initial peak) (Chandrasekaran and Tellis, 2011). Managers, knowing the existence of the saddle, can recognise the presence of it and make decisions based on the fact that it could resume. The study was confuted for products belonging to the category of laundry/kitchen products and information/entertainment products. In the moment of recession, the goods belonging to the category information/ entertainment performs better, especially if they are sustained by the word-of-mouth, and invest in technological innovation, recognised as a power tool for moving from the saddle (Chandrasekaran and Tellis, 2011). This phenomenon was already observed for very new household consumer durables (Golder and Tellis, 1997), on which there is a take off in sales at immediately, at the introduction stage. The take off is defined as

> *the point of transition from the introduction stage to the growth stage of the product life cycle* (Golder and Tellis, 1997, pg. 1997)

The PLC has been investigated from different perspectives: products, brands, markets, product category life cycle, process life cycle (Bayus, 1994, Hayes and Wheelwright, 1979, Shapiro and Slywotzky, 1993). Hayes and Wheelwright (1979) aim at making the PLC a more powerful framework by incorporating it in another vehicle for exploring strategy options: the product-process matrix, used for conjuncting the traditional strategy formulation models, adding a nuance and an extra insight (Hayes and Wheelwright, 1979). The authors sustain the coordination and mutual understanding between marketing and manufacturing functions in companies is broken down in order to favour growth of sales within an existing product line and market, as well as expansion of the product line, vertical integration and expansion into new products and markets (Hayes and Wheelwright, 1979). The PLC does not concern only products, but can assess the market maturity. Shapiro and Slywotzky (1993) suggest that managers analyse the PLC of the market to avoid entering a market during the maturity or decline phases. The managers should be sure to enter when the product category is at its early phase of the market, in an open field on which the competitors have not yet arrived. At this point, the customers can be identified and the process

of building high levels of loyalty can start (Shapiro and Slywotzky, 1993). Considering the PLC of the market, companies can decide to adopt different strategies: pioneer strategy (introduction of a new product in the market), imitator (fast imitation of a product recently introduced to the market), rapid innovation strategy (shortening planning time in product development cycle), disruptive technology strategy, pre-announcement strategy (making public disclosures of product releases), and partnering strategy (strategic alliances with other firms) (Nadeau and Casselman, 2008). The PLC is considered an influential concept in marketing (Golder and Tellis, 2004, Moon, 2005), used as central and enduring framework in decision making concerning corporate strategy, finance, production, product development and product portfolio (Golder and Tellis, 2004). The concept has been further developed by Kotler (1972), including different applications, such as depicting the demand life cycle and the demand-technology life cycle. Moreover, different life cycles have been depicted for specific technologies (Abernathy and Utterback, 1978), customers, and their adaptations of new technologies (Rogers, 1995), dominant designs (Anderson and Tushman, 1990), and for specific industries and clusters, such as motion pictures (Calantone et al., 2010). Kotler (2009) proposes that four things are implied when stating that a product has a life cycle: (1) products have a limited life; (2) product sales pass through distinct stages; (3) profit rises and falls at different stages; and (4) products require different marketing, financial, manufacturing, purchasing, and human resource strategies at each stage. Golder and Tellis (2004) find that the main shortcoming of the PLC relates to the lack of clear metrics for the turning points that define various stages. PLC is considered a vitally important phenomenon in marketing management for at least three reasons (Golder and Tellis, 2004). First, the pressure on managers varies dramatically before and after the turning points in the life cycle; second, the level and growth of sales changes consistently across stages of the life cycle; third, costs and prices decline substantially over the life cycle, especially during the early phases while consumers' sensitivity to price increases over the stages of the life cycle. Moon (2005) recognises the existence of the PLC but invites to deviate from it. Once a firm has detected at which stage of the curve the product is, it should try to detach it from its current path and surprise the customers, by positioning the product in an unexpected way, making it more appealing. Firms, thus, should learn how to play with the PLC with a sapient use of advertising and promotion, emphasising the most distinctive characteristics and features, propelling the products backward or forward into lucrative growth phases (Moon, 2005). The proposed strategies are three: first, reverse positioning, giving new attributes to the products;

second, associating the product with a radically different category; finally, proposing a few offerings by hiding the original ones (Moon, 2005). The critique that has been aimed at the PLC theory disputes that its premises are problematic: Polli and Cook (1969) reflect on the assumption that the PLC is largely independent from the firms' marketing activities, while it may be that changes in advertising, could affect the curve. The authors also reflect on the possibility that what managers consider saturation, it could simply be market maturity, and the saturation can happen when new products not technologically compatible are introduced. Wood (1990) points out that the lack of data in most companies prevents the PLC from being usefully applied. DeBresson and Lampel (1985) use the notion of PLC to describe the technological trajectories (called TLC) production modes, organisational discontinuities, and unforeseen innovations produce a highly complex situation, which could not be predicted with a PLC.

Bayus (1994) examined seven empirical studies and found that generally speaking there is no strong empirical support for generalising a PLC for an industry, a product category, a product technology, or product model level. He concluded that the shorter the PLC seem to be, the more the decisions are based on the intuition and gut feelings of managers and consultants, rather than on the available empirical evidence.

Other scholars have provided alternative interpretations of the PLC that could prove useful for understanding the dynamics. Dhalla and Yuspeh (1976) offer another perspective, because they criticise not only some aspects or some interpretation of the PLC, but its very concept, doubting about its effective existence. They present the argument that the PLC is considered an independent variable that companies should adapt to their marketing programs. It could become also a dangerous self-fulfilling prophecy, since the managers, when they think they are in the decline phase often act by premature outbacks in marketing and advertising support, while appropriate marketing campaigns can revitalise the sales. It is more appropriate for the PLC to be considered a dependent variable with the consequence that marketers could alter a product life cycle (Dhalla and Yuspeh, 1976), since the PLC is the consequence rather than the cause of marketing choices (Moon, 2005). They present four arguments: (1) not all products have a limited life, and it is not unusual for products to gain a second life or reincarnation (Dhalla and Yuspeh, 1976, pg. 103); (2) it is difficult to predict when the next stage will appear, how long it will last, and what levels the sales will reach (Dhalla and Yuspeh, 1976, pg. 104); (3) the concept of PLC per se is misleading and is not applicable to brands (Dhalla and Yuspeh, 1976, pg. 104); and (4) no statistical evidence for the average life of brands can be

found because some brands last for few years and others are still present in the same category after more than 100 years (Dhalla and Yuspeh, 1976, pg. 105). This is due to the consideration that the PLC is a descriptive tool, but has limited prescriptive value. However, the PLC has been losing its validity because the market, the technological improvements, the levels and the speed of technology, the likelihood of acceptance of the product in the marketplace and the more frequent taste changed compared to the Sixties, the years in which the curve has been theorised (Bayus, 1994, Moon, 2005). The PLC looks at the single products of the firm and is not able to understand how they relates to each other. The notion of the PLC with more or less well defined phases and stages is difficult to apply as a predictor. Wood (1990) proposes that with the PLC, there is no way of knowing at which stage a product is, and it is meaningless to compare PLC for different products, because differences may be caused by different marketing strategies. A relevant limit of this theory is that it tends to be backward looking. Kotler (2009) later responds to the critique by including other curves and declaring that the length is variable: a product often does not follow the classic types of PLC curve, but there are different curves for different kind and typologies of products (see appendix for the shapes of PLC).

Rapid prototype

> *Prototypes are approximations of the real product along one or several dimensions of interest. Prototypes are important even for professional designers; and they play an even bigger role for user design*(Randall et al., 2005, 80);

they are low cost, yet increasingly capable rapid prototyping and manufacturing processes, including 3D printing, fabrication and tasks (Ulrich, 2011).

> *Rapid prototyping technologies, which might more appropriately be called inexpensive prototyping technologies, allow the designer to produce relatively more prototypes for actual testing and can therefore reduce the importance of accurate forecasting of design quality. In the hands of a novice designer, the act of testing many prototypes can substitute to some extent for expertise in exploration and evaluation of designs and thereby enable user design where custom design or common design was previously the norm* (Ulrich, 2011, pg.65).

Scenario Building This tool is used by the management at the beginning of the process for developing a new product, during which the aims and the goals among the members of the team are announced, shared and agreed. The brief is discussed and decided, and the management and the design team agree to the same objectives. Moreover, different trajectories for the NPD are discussed in terms of technology needed, and possible markets are discussed.

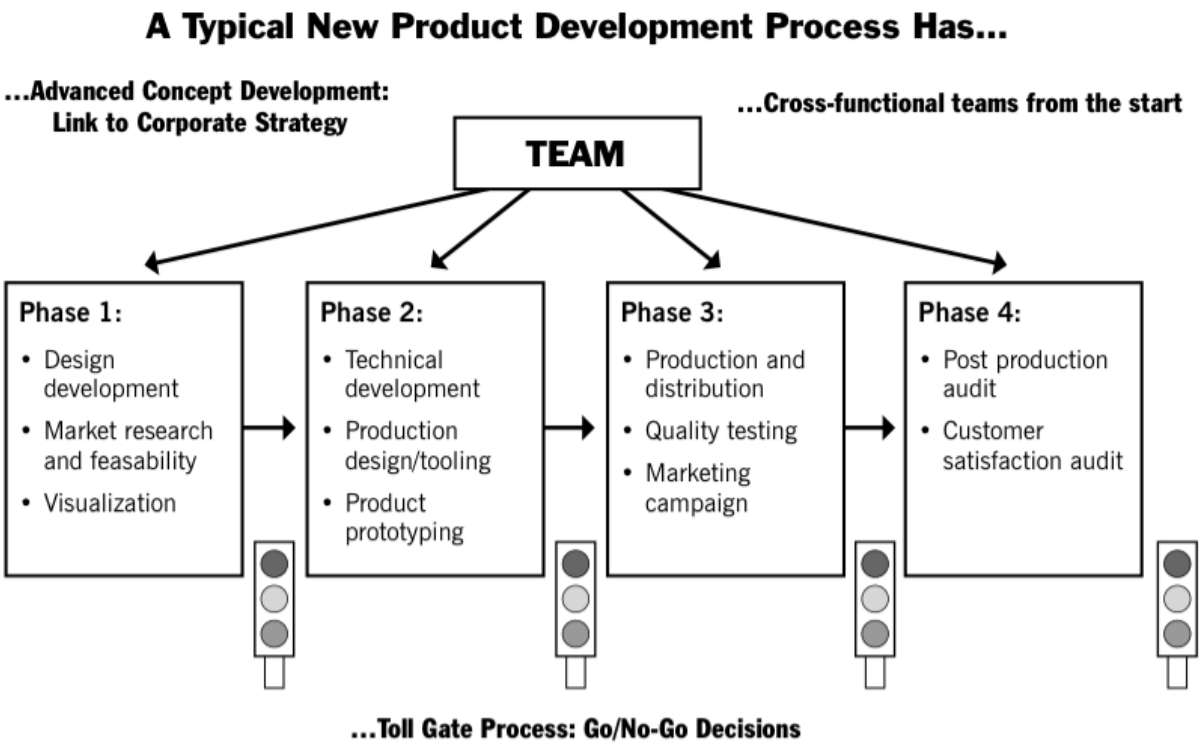

Figure 2.8. Stage Gate Model in a design process in Hertenstein and Platt (1997), pg. 12 .

Stage-Gate Model For a more accurate description of the stage-gate model, see the section design process.

Storyboard It is a tool through which it is possible to visualise and draw the images that are useful to identify and visualise the interaction of the product or service in the context of use (Krippendorff, 2006).

Trend grasping research It is oriented to capture the signals and the content necessary for the definition of the trends in the market. This is based on observing certain customer groups to capture the values of the different social groups, the trends and what is happening in the cultural industries.

2.4 Summary - Second perspective: New product development process in industrial design

The following figure represents the most recurrent words in the second perspective. They are calculated among all codes individuated for the co-word analysis

Figure 2.9. Most recurrent words in the second perspective .

The main concepts developed in this perspective are summarised in the following table:

Design definition	Design comes from the Latin *designare*, which is translated in English both as to design and as to draw. The noun design, in English, has retained its dual meaning: a plan, a project, an intention, a process or a sketch, a model, a motive, a decor, a visual composition, a style.
Design Process	Stage- Gate model; identification of customers' needs (customer contacts, technology exploration, idea generation, concept generation (brief, scouting, design decision making) design and development (prototyping, packaging, launch plans, material testing), production, launch (designing launch and promotional material)
Role of Designers	Creativity, problem solving, observation, interpretation of data, aesthetic judgment, stretching, drawing models, ergonomic analysis, multidisciplinary thinking, working in multi-disciplinal and multi-factional teams, critical analysis and selection, designing for manufacture, visualisation, critical analysis and selection
Role of Management	Choosing the designers able to complete the NPD within the time and budget constraints, facilitator, choosing the most appropriate form of design of the organisation, interaction with other functions internal at the company, interaction with stakeholders, negotiation capabilities and problem- solving, liaison with internal functions, communicate, diplomat, relationship management, business and market analysis interpretation, motivate, leadership
Value Creation	Creating value for the company (higher price, lower production cost, better company image), delivering value to the customers (packaging, brand value, usability, durability, value for money) creating emotions, symbolic and relational value
Technologies of management	used for: market observation, market segmentation, market and technical research informing, observation of customer response, monitor the production, monitor the quality.
Principal Authors	Farr (1965); Rothwell and Gardiner (1983); Walsh et al. (1988); Dumas and Mintzberg (1991); Hertenstein and Platt (1997); Borja de Mozota (2003); Heskett (2005); Cooper et al. (2003);Chiva-Gómez et al. (2004); Norman (2007); Chiva and Alegre (2009)

Table 2.4. Summary- Second perspective on Design Management: New Product Development Process in Industrial Design.

2.5 Third Perspective: Managing As Designing - Managers as Designers of the Organisations

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2.5.1 Design definition

According to Buchanan (2004) and Boland and Collopy (2004b) design is a strategic discipline of management, whose aim is to facilitate the relationship between people and objects, the recognition of different typologies of knowledge and expertise for managing organisational operations, taking into account the critical importance of accounting, finance, human relations, strategic planning and visions, as well as the socio-cultural context. Weick can be considered the founder of this perspective, and he anchors his argument in chapter 5 of the book *Science of artificial* (Simon, 1969). He provides a definition of managing as designing similar to the interpretation of design of Simon (1969):

> *Managing as designing means, in part, the monitoring, containing, and reversing of compounded abstraction* (Weick, 2004, pg. 41).

Constructing design in dynamic environments requires that information from diverse sources are integrated, that design options are identified, and that exploratory learning occurs concurrently with management of the ongoing organisation (Weick, 1993). Design is a tool to help the decision making process, because it relies on improvisation, and it has unintended consequences. Design enables people to be aware of what is happening in their environment, helping them to understand the changes in the structure, and encourages people to generate novel, compelling and elegant solutions (Weick, 1993). Design is a tool to help people to cope with multiple meanings, by making things more social, more tolerant for improvisation, and affected by actions, and to carry out an action of sense-making: design is grounded in decision making (Weick, 1993). However, the decisions that are made do not necessarily lead to innovation, as in the previous perspective, but to better managing and designing of organisations (Boland and Collopy, 2004b, pg.8). Weick (2004b) suggests that design is about the progression in designing from a purpose, from principles to people, from concept to structure in practice.

The researcher recognises that the relationships are complex, and to reach an agreement is necessary, by mobilising attracting alternatives, and making them dynamic and negotiable. Nevertheless, design is an ambiguous term, variegated with different meanings and uses:

> *on the one hand design creates nothing. By itself, design is an empty vessel waiting to be filled with people, meanings, and actions. It is a dead dorm that has no life or energy itself. Yet on the other hand, it creates everything since the organisational design will have a fundamental framing effect on people's expectations and perceptions, setting the context for the organising activity- the social construction of roles and relationships- thought which structure is enacted* (Weick, 2004b).

Therefore, design is a compounded abstraction, a mental concept of human relationships in a world made of complexity and diversity. Design is a sense making activity that includes perceptions, conceptions, forms, coordination and formalisations (Weick, 1993), it

> *is a battle of sorts between naming the thing and losing the dream, and keeping the dream but loosing the name and stirs others to make the dream happen* (Weick, 1993).

Cook interprets design as a translation between different languages, a representation that reflects the world' s preoccupation with operating with different symbolic meanings (Cook, 2004). Buchanan (2004) affirms that the designs have different facets, and each represents an important place in the organisational life for reaching goals and objectives. Design as industrial design is used to implement the core of manufacturing (consumer products, machines, tools, and equipment); interior design has the scope of improving the spaces for making the work environment more efficient, more usable by customers, and more interactive; system design is used to create good tools for decision making; interaction design is used to understand in the organisations how people relate to each other and how products mediate the relationships in the organisations (Buchanan, 2004). Therefore, design is about shaping, giving forms:

> *by design, we mean the giving of form to an idea- shaping artefact and events that create more desirable futures* (Cook, 2004, pg. 92).

Lyytinen (2004) defines design as an activity 1) to make preliminary sketches, patterns or an outline for them; 2) to plan, carried by artistic arrangements

or skilful manners; 3) to form plans in the mind, contrive; 4) to plan purposeful intents; 5) to set apart for some purpose. The definition carves out design as a human activity that is inherent purposeful, cognitive and participatory, with a certain level of proficiency in getting it done with a rational moment of analysis. This definition of design emphasises that the challenge of the discourse about design is its generality: any activity counts as design as long as it has an intentional element and is not habitual adaption, but orients the designers and the users towards shaping a future world in the form of an artefact through cognitive engagement, letting it interact with other artefacts, including sketches or patterns (Lyytinen, 2004). A commonality of all the design definitions is that the design is driven by decision-making process, control, prediction, by the capability of the designer to meet the given anticipations, by the possibility that people have a context to work that is not planned, sketched and anticipated. This is translated in the role of manager in making sense and creating things, structuring the process by influencing and mobilising knowledge, structures, mechanisms, social and technical elements.

2.5.2 The design process

As already mentioned, this perspective is departing from the researches of Weick (Weick, 1993, 2000, 2004b, Weick and Sutcliffe, 2001). Weick challenges the notion of organisational design and proposes more fluid features of organisation. Design is a process for designing the organisations. The world of the organisations is constituted by unpredictability rather than stability, so managers design organisations to be reactive to unpredictable events. How people react and what people do is an effect of an organisation's design and of the understanding of it (Weick, 1993). Design of an organisation determines the managers' ability to make decisions, since it decides and influences the allocation of resources, power, and information (Weick, 1993). Weick sustains that organisational design is a continuous activity, and managers (including middle managers) can design complex ways for interpreting the resources for redesigning the organisations, acting at any given moment with these interpretations. As such, design is an activity that helps the decision-making process. The design of an organisation determines the distribution of resources and information, it impairs the ability of individual managers to make and to implement timely, technically and economically acceptable decisions (Weick, 1993). The design of an organisation also affects the managers' ability to coordinate and control the activities of their subordinates and to deliver proper organisational performance. Weick (1993) makes ex-

plicit the necessity of designing organisation on being flexible, and rapid in inserting technological changes in the organisation to increase the organisational efficiency. Design is useful for facilitating improvisation, attention, extrapolating from the past the data from the past for more effective solutions in the future.

> *The key point is that designing often consists of a shifting pattern of attention and meaning imposed on an ongoing stream of social activate, rather than a stable pattern of intention imposed a priori on events initiated to achieve an outcome* (Weick, 1993, pg. 351)

This means that design instead of codifying previous unplanned changes creates future planned changes. Design process is then a process of codification, in which events often unfold. For this reason,

> *designing is synonymous with bricolage (...) and the bricoleur is a thinker who makes creative use of whatever builds up during the process of world* (Weick, 1993, pg. 352).

The metaphor indicates that the managers act as bricoleurs, drawing and assembling organisational life from the raw material that is available to them, then using what they have at their disposal. In Weick' s understanding, resources are pragmatic and are defined by conditions of their use. To design the organisation, managers need to redefine the crucial uncertainty facing the organisation (Weick, 1993). The design process is not an isolated process or performed by single individuals. It is blended in the final version, embodying multiple designs and designers. The result of this process is a product that embeds bricolage as well as a unity and that moderates the demands for coordination (Weick, 1993). Hence, the design process is based on design thinking, leaving out the definition associated only with artistic features, appearance, graphic communications, industrial products, interior spaces and buildings, while describing it as a discipline for solving problems in practical life through the creation of products that have intellectual integrity, emotional and aesthetic satisfaction (Buchanan, 2004). Managing as designing is the re-configurative production of visions and articulated production of decisions (Engestrom, 2004). To adapt to this description of managing as designing, Weick (2004a) presents the concept of thrownness (Being-in-the-World), a principle from the philosopher Heidegger, meaning that people are always thrown into the middle of doing something, in situations with a history, with actors, cultural norms, path-dependent infrastructures and laws. This means that managers and people in the organisations are constantly

re-designing, interrupting and re-contextualising (Weick, 2004b). The idea of thrownness is about defining the world, the situations that people face are something they are dropped into, they are a complex, multi-faced working situation, and a blank space that needs to be created and being controlled (Weick, 2004a). Design process helps to spend a lot of time discussing about the project, trying to predict whether it will work or not. Managers have to understand as having being dropped into the middle of agendas, activities, interested already on the way, thrown in the situations where they have to make choices. They have to act as designers, they should be bricoleurs working through things (Weick, 2004a). The design process always has something going on, and people, whether they are designers or clients, are always in the middle of something, which means designing is about re- designing, interrupting, assuming, conducting, and re- contextualising (Weick, 2004a). Weick (2004a) states that people cannot avoid acting, cannot step back and reflect on the decisions made, the effect of the actions cannot be foreseen, because the representation of the situation is not stable and we are in a constant stream or flux. People are thrown into their own intuits and have to deal with whatever comes out as it comes up, the effects of action cannot be predicted, every situation has a representation (that is an interpretation) which is not stable, and each action is represented in language.

> *Expectation and perception setting the context for organising activity, the social construction of roles and relationships through which the structure is enacted. Design is a mental concept of human relationships in a world of exploding complexity and diversity* (Weick, 2004a).

In this view, design processes are not perceived as a gap to fill, but as an opportunity to explore. Managers, during the process, are asked to make difficult decisions, possessing only ambiguous and conflicting information, with shifting goals. They are asked to act under time pressure and in dynamic conditions, in complex operational team structure, with poor communication and every course of action carries a different understanding of the situation that is occurring though acting (Boland and Collopy, 2004a). This is how the author defines thrownness, a pre-reflective experience of being thrown into a situation of acting without the opportunity or need to disengage and functioning as detached observers. Managers make design fully formed, visible, and influential, but at the same time make it emergent, locally rational and make it a force for driving conditions for organisational change, involving many actors and managers focusing on the design of the processes and interpretations. The outcomes might not be easily predictable as they are more of

a network effect than the result of carefully managed phase models. Design thinking is central for the strategy development, organisational change, and constraint- sensitive problem solving (Boland and Collopy, 2004a). Managing as designing is considered a collaborative process, not the work of a single manager, since the value created is achieved at the organisational and societal level, and the managers are directing this process. The design process is an iterative process. It connects diverse kinds of knowledge and links specialised experts who design and execute organisational operations, service activities, relationships with customers, suppliers, government, experts on social and cultural context of the organisations, and internal planning and management activities (Buchanan, 2004). The steps of the process of interaction design, translated into design management process, begin with identifying a vision, seeking to clarify, understand, and help to shape the governing ideas of an organisation. It proceeds with a strategic planning for the purpose of generating ideas and create a specific brief for how to select the most suitable solutions (Buchanan, 2004). The design process is about the re-configurative production of visions and articulated production of decisions, that are fostering new practise, changes (incremental or radical), they invite to dialogue and cooperation, they have different ways that people interpret and create appropriate space in the organisations (Orlikowski, 2004). Organisations are in the making and both managers and designers are responsible for the creation of socio-material arrangements, through which is possible to act. Design process is a plethora of invisible work, and everyday ordering practices are obscured by professional discourses of management of design; therefore, the need to develop critical practices based on forms of participatory and cooperative design(Orlikowski, 2004).

2.5.3 The role of designers

The idea behind the perspective of managing as designing is that what managers do actually is very closed to what designers do, which is designing things (design organisations, design processes, design products, or services). Therefore, if managers become better designers, they can become better managers, because the world needs new kinds of organisation forms, new ways of collaborating, of forming teams in organisations, new ways of approaching new problems (Boland and Collopy, 2004b). Designers have to make managers realising that the world is changing, the decision making process has to adapt to the given changes and that the used are not enough evolved (Orlikowski, 2004). Designers engage managers in the day to day activities in design. Designers help managers to better understand the situation and

make more appropriate and better decisions (Lyytinen, 2004). Designers have to assist managers who are going to be judged according to the success or failure of their products, manufacturing practices, employment policies. They affect the environment, the community in which they participate, and in firms in which they have a have stake. Management is about connecting all the projects together, so there is a need for people and the assistance of designers to keep networks together a particular time span to operate with liquidity and crystallisation (Czarniawska, 2004b). For managers, serendipity, fluidity and opportunism are characteristics in the project that must be present. Designers are inspirational figures that managers analyse and try to apply their characteristics to their managerial processes. The designers are able to anticipate and predict what designs they can achieve, better ponder over past actions and future plans (Weick, 1993). Improvisation is part of the decision- making process, and design should help with the choosing and implementation of a good alternative (Boland and Collopy, 2004a). Designers are inspiring people that create artefacts that people care about and which exhibit and endure aesthetic quality. Therefore, designers inspire managers to develop a deeper awareness of, appreciation for, and ability to engage with the generative power of human enactment (Cook, 2004). Designers transmit the concept of enactment, a critical concept indicating that other actors (a part from designers) have a role in realising their design (papers with sketches, white boards and computers with models, graphics, texts, in software, hardware, all the tools and persons that make representations of different realities possible, and the creation of desirable futures), which outcome depends on actions, decisions, enactment of design, and for the laminal space of enactment there lies the opportunity for slippage, for resistance, for learning, for change, for people to choose to do otherwise with the designs handed to them (Cook, 2004). Designers also encourage managers to deal with emergences, with understanding the relations between the actors that enact them in practice by committing to co-create. The author also suggests that designers should engage people and managers in such a way that can lead to transformed meanings, identities and intersubjective actions and relations, stimulating each other's knowledge, reflecting order to understand the cognitive, and social materials and structural consequences of their design. This process can result in a change in the managers and their actions as a consequence. Designers and managers would thus both benefit from explicit attention to the critical influence of reflectiveness and to the generative power of enactment in the ongoing production of social and material realities (Cook, 2004). Designers can also teach managers how to manage uncertainty, how to stimulate creativity, how to solve problems,

since designers are mediators having interactions that are highly conceptual, cooperative and complex. On the other hand, designers should learn from managers how to displace the concepts and how to be persuasive with other people (Wagner, 2004). Designers are producing very diversified material, and with different degrees of abstraction, scale and materiality (text, diagrams, comics, videos, sketches, models, 3D), and the diversity of design artefacts increases their possibility of evaluating the design, as each representation helps make particular aspects of a design visible, transforming and reprogramming, working with placeholders, developing persuasive artefacts that give great visibility (Wagner, 2004). The essential part of planning is the production of persuasive artefacts that convince people of the viability of the design solution, involving others in a dialogue and stimulating their imaginations. Designers are people who can reduce anything to its basic form, explain it to others, and lead to ask better questions (Chung, 2004, pg. 185). Designers, in order to produce innovation (whether incremental or radical) begin with the understanding the problems that need to be solved: first, designers formulate the problem, then look for the the data they need, through observational research methodologies to reveal latent needs that can form the basis of change initiatives (Chung, 2004). Designers observe, take pictures, ask questions, mock journeys, make spatial observations, absorb the atmosphere of a location, find behavioural patterns. After having done this, they create frameworks so that they can unify design opportunities in order to conceive possible futures and make sure that all the parts and pieces that compose these futures are coordinated (Chung, 2004).

2.5.4 The role of management

The manager is an idea generator who gives form to the new possibilities with a vocabulary of design, a default alternatives who understands the design of better products, processes and services. Managers should realise that having a new attitude towards problem solving is not only about implementing a creativity decision, but also about creating innovative and long- lasting organisational betterments. Leadership and management should rebuild the systems in the dimensions of human experience (Buchanan, 2004). The role of managers as designer is rarely mentioned in the literature, and barely acknowledged in business practice. Managers practice silent design by making concrete the many decisions that are emerging among the interactions of the multitude of non- designers who enter directly into the design process, most of the time unaware they or others may have impact on it (Dumas and Mintzberg, 1989). The management' s focus, in this perspective, is

concerned with the understanding of a multitude of processes and decisions spread across the organisation: each person is asked to participate in the design of structures, processes and visions. All the persons involved in the organisational processes become part of the design processes and are in some way designers; managers direct them. The organisational design can have an impact on managerial ability (Weick, 1993). Managers should approach problems in a similar way that designers do, with a similar attitude and sensibility, vitalising designs for products, services, and processes that are profitable, sustainable and friendly (Boland and Collopy, 2004a). Managers have to develop a design attitude, which goes beyond default solutions in creating new possibilities for the future. Managers make decisions and have a problem-solving attitude that is much closer to design attitude than rational choice-making using economic analysis, risk assessment, multiple criteria, decision-making, simulation, and time as value of money (Boland and Collopy, 2004a). The rational attitude to problem solving is considered rather passive, and is not taking into consideration a different number of variables, while the design attitude is concerned with finding the best possible answer, given the skills, time and resources of the team; this requires the invention of new alternatives (Boland and Collopy, 2004a). There is a parallel between the contexts and the practices of designers and managers: in the literature, they are both described as having authoritative positions that rely on expert knowledge, training and socialisation; they have institutionalised and professionalized domains of specialised activities and identities; they have influence and power; they embody and employ a separation of conception and execution, which sustain a divide between time, place, norms, interests, values, discourses and practices; they engage in social engineering, designing and managing the artefacts, spaces, or organisations that others engage with, thereby shaping and configuring the lives of these others. The representations that are set apart from the embedded and embodied doings impose a formal, selective and abstracted order on ambiguous, contested, multiple, social and dynamic terrains, managing consequences and generating outcomes (Cook, 2004). This indicates that in producing representations, the fields of designing and managing produce social and material realities: both activities describe, inscribe and prescribe how, why, when and where (Cook, 2004).
According to Czarniawska (2004a) part of the duties of management is to build an action net, which is described as a general concept referring to a way of studying organisations, suggesting that organising and connecting different social actions. An action net is a network of which organisations are also part of it and perform. Sometimes connections are informal, other times they are formalised by contracts, and binding organisations rather than

single actions. This is not a network of firms, because a

> *network, as it is popularly understood, is a set of connections among actors, whether people or organisations. Actors first connect, then they do something together. Actors come first, action comes second* (Czarniawska, 2004a).

It connects collective actions by translating one into another. Managers have the role of understanding how to create and modify the space and the organisations around them and develop the net. The concept of managing as designing empowers all the managers in the organisation to act and embrace design (Orlikowski, 2004). The managers have analytical skills (capability of cooping with a complex set of data and alternatives and make the most appropriate choices), human skills (the ability to get appropriate tasks done through and with other people), pathfinding skill (the ability to find the best way between different alternatives that can help the company to survive long term), and design skills (that is the ability to create appropriate makeshift short term and durable long term design on corporate philosophy corporate lifestyle, integrity, management structure, people training, operations, finance, product design, and strategic review) (Orlikowski, 2004).

2.5.5 Value creation

The value is created through the organisation architecture, and the scope is to create a lasting value for the society. If managers behave with a design attitude, they can be flexible and reactive to competitors and change situations. They can create sustainable products, sustainable working conditions that can benefit and create value for all the stakeholders involved in the firm (Boland and Collopy, 2004a). Problem representations are important to determine how well or poorly managers perform and create value. Value is created through the use of language, developing awareness. Design is a vehicle for creating dialogue across socialised professions (Weick, 1993).

2.5.6 Technologies of Managing

The technologies of managing are not well described in this school of thoughts, but they could also be interpreted as heuristic devices that are used (like sketches) at the early stages of a management inquiry. They could be defined as also tools to mediate the dynamic interrelationships between multiple tangible and non tangible elements, that are notoriously challenging to understand or remember. The technologies of managing can be described as

tools used for translating and transferring the methodology or architectural diagrammatic sketches for reusing of precedent knowledge. They are also sustaining the work and facilitating the tasks of managers, which means leaving out the complexity of information in order to allow managers to make decisions (Boland and Collopy, 2004b).

2.5.7 Summary - Third perspective: Managing as Designing

The following figure represents the most recurrent words in the third perspective. They are calculated among all codes individuated for the co-word analysis

Figure 2.10. Most recurrent words in the third perspective .

Design definition	Managing as designing means, in part, the monitoring, containing, and reversing of compounded abstraction; on the one hand design creates nothing. By itself, design is an empty vessel waiting to be filled with people, meanings, and actions. Yet on the other hand, it creates everything since the organisational design will have a fundamental framing effect on people' s expectations and perceptions, setting the context for the organising activity and the social construction of roles and relationships.
Design Process	The design process is based on design thinking. Design thinking is not only associated with artistic features, appearance, graphic communications, industrial products, interior spaces and buildings, but also provides a discipline in defining and solving problems in practical life though the creation of products that have intellectual integrity, emotional and aesthetic satisfaction; managing as designing is considered a collaborative process, not the work of a single manager, since the value created is achieved at the organisational and societal level, and the managers are directing this process.
Role of Designers	Designers are inspirational figures for managers, helping them to develop a design thinking mindset to solve problems and make decisions they share.
Role of Management	Managers are an idea generators who give form to new possibilities with a vocabulary of design. The new attitude towards problem solving is not only about implementing a creative decision, but it also about creating innovative and long- lasting organisational betterments, and shaping the space of the organisation.
Value Creation	Managers should organise the company in such a way that is assured a workflow, with an attention to competitors and changing situations, then they can create sustainable products, sustainable working conditions that can benefit and create value for all the stakeholders involved in the firm.
Technologies of management	Different organisational structures.
Principal Authors	Boland and Collopy (2004b), Weick (2001)

Table 2.5. Summary- Third perspective on Design Management: on Design Management, managing as designing.

2.6 Fourth perspective: Design As Proposals Of New Meaning

'This perspective focuses on fostering radical innovation through design. The stream was initiated by Verganti, basing his ideas on Krippendorff's theories on the semantic turn in design, and translating them into developing innovations through design driven innovation. The reference that was used for Krippendorff is his book *The Semantic Turn* (Krippendorff, 2006), that is a resonate collection of his theories. Design driven innovation is defined as a process producing radical design,

> *where innovation starts from the comprehension of subtle and unspoken dynamics in sociocultural models and results in proposing radically new meanings and languages that often imply a change in sociocultural regimes* (Verganti, 2011, pg. 387),

leading to the development of new breakthrough innovations in products' meanings (Dell'Era et al., 2010).

> *Radical changes in meanings instead ask for radical changes in sociocultural models, and this is something that might be understood (and affected) only by looking at long-term phenomena with a broader perspective. Design-driven innovation is therefore pushed by a firm's vision about possible breakthrough meanings and product languages that could emerge in the future (Dell'Era et al., 2010, Dell'Era and Verganti, 2009, Verganti, 2003). As this vision cannot be developed solely by looking at current user behaviours, the process of these firms has little in common with user-centred approaches* (Verganti, 2008, pg 438).

2.6.1 Design definition

> *The etymology of "design" goes far back, of course, to the latin de+signare, which means to mark out, set part, give significance by assigning it to a use, a user or an owner. Design has the same origin as "sign" and "designate", calling attention to something other than its observer-independent existence: meaning. Based on these original meanings, one could say: design is making sense of things. Design is a sense creating activity, which claims perception, experience, and perhaps appearance as its fundamental*

> *concern and this interpretation is quite intentional. Or, it could mean that the products of design are to be understandable to their users. (...) Making sense is the result of human activity* (Krippendorff, 2006, pg.1).

Verganti, using this definition, states that:

> *the etymology of design goes back to the Latin de + signare and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners or goods. Based on this original meaning, one could say: design is making sense of things* (Verganti, 2003, 2008, 2009).

Design is composed not only of the product's aesthetic appearance, but also its functionality.

The authors sustain that the semantic turn reviews the history of semantic concerns in design, recognising that customers not only look at the the physical properties of things in their forms, structures and functions, but also consider the individual and cultural meanings. Therefore, the products have to make sense, providing meanings and social significance. Design inspires innovation by exploring the ways in which communities of art, design, and innovation are amalgamating and influencing to create radical and breakthrough products that delight the customers (Dell'Era et al., 2010, Utterback et al., 2006).

> *In English, the word design- like the work innovation- refers both to a process and the outcome of a process, which only makes the challenge of defining it more difficult* (Utterback et al., 2006, pg. 59).

Design, in this perspective, is the creation of meaningful artefacts and products.

> *Design is not about the creation or the use of new technology in a narrow sense, and it is certainly not about the creation or use of new technologies for their own sake, although design activities can lead to the creation or use of new technologies (Verganti, 2003). The point is that technological innovation is partially about the development of new technologies, in the narrow sense of building technical novelty into products, but it is also about the creation and incorporation of new or significantly altered concepts and ideas. The deeply embedded understandings that both designers and users come to associate with products can make us very conservative* (Utterback et al., 2006, pg. 71).

Design is not only appearance of technical improvement, but it conceptualises artefacts in their material and social dimension, chasing and proposing a meaning to their users. Design is considered human-centred, and take into account that humans use and appreciate the meaning of the things more than than physical qualities. Hence, a successful design conveys meanings of all the stakeholders who can move an artefact through its life cycle, making it part of a social process, and give rise to further developments (Krippendorff, 2006). Verganti (2011) indicates that the term's meaning is intended as the reasons (psychological and cultural) why a product is chosen and used, stimulating both the individual motivation (psychological and emotional meaning) and the social motivation (symbolic and cultural meaning).

2.6.2 The design process

The new product development' s goal is to create a product that could delight the customers, that is easy to use, elegant, neat, meaningful, sophisticated but simple, and able to capture the customers' attention (Utterback et al., 2006). Therefore, the product resulting from the design process is a product that has an unique combination of technology and market, and is meaningful for the customers (Dell'Era et al., 2010). The scope of the NPD process is to intentionally develop new winning design (Utterback et al., 2006) by anticipating the customer satisfaction, proposing a new product, being efficient in the development process, and being ready to react in case of failures. Design is not about the establishment or the development of a new technology (even though design can generate or implement the use of new technologies), but it is about the creation and incorporation of new or significantly altered concepts and ideas (Utterback et al., 2006). Design is a collective and networked research process of meanings and design languages (Buganza et al., 2009, Dell'Era et al., 2010, Dell'Era and Verganti, 2007, 2009, Verganti, 2006, 2008), and can be represented as a stream of symbols. Design, if well managed, leads to radical innovation, through the process of design driven innovation (Utterback et al., 2006, Verganti, 2006, 2008, 2009).
The design process aims at integrating the technology, the needs and the language. Language is an important component in the design discourse. In Krippendorff (2006), language is a complex concept, a culture, a mean that enables humans to coordinate their propositions, to agree for joint action, and to allows the construction and reconstruction of the realities. It is intended as a system of signs and symbols, individual expression, a medium of interpretation, a process of co-ordinating the perceptions and actions of

speakers, a language use that directs attentions, frames perceptions, but it is also relational: everything said is said by someone in the expectation of being understood by someone else (Krippendorff, 2006). Consequently, using language, acting and perceiving are all actions tied together to construct an understanding of the objects. Language is not only spoken, but also written and communicated, and it is the mean that allow human beings to be understood. Through language, meaning is created, the fate of the products is deterred, and the social praxis constructed. Meaning is intended as sense, as perception, as something that can be experimented with, and having imaginable uses (Krippendorff, 2006). Through language, humans create metaphors to better explain the concepts and narratives. They are constructions forged with the expectation of being understood and with the scope of making sense to the objects that occur to the narrator (Krippendorff, 2006). Meanings, thus, are not only created, but also acquired in conversations through language. Designers can participate in the conversations that improve the understanding and the narratives around the objects to construct meanings. Meanings are not rooted and permanent, because they can change according to who participates and experiences are shifting (Krippendorff, 2006). Therefore meanings are flexible, variable, and invoked by senses, which are defined as

> *the feeling of being in contact with the world without reflection, interpretation, or explanation. Sense is also informed by dispositions, needs, and expectations, including emotions, all of which have to do with the human body* (Krippendorff, 2006, pg. 50).

Sense is personal, embodied in the phenomenon, patterned, something that takes place in the present, not separable from its cause and from one person's expectations. In order to test the use of the language, it is necessary to decompose a design into networks of conceptual components and relations, to create lists of ways in which each component could be realised and felt familiar, exploring how the design could fit into the users'environment of other artefacts, to reconcile the incompatibilities between the components, and to test how users distinguish the design's components (Krippendorff, 2006). In the following representation, Verganti explicates the relations between language, needs and technology to construct a meaningful design product:

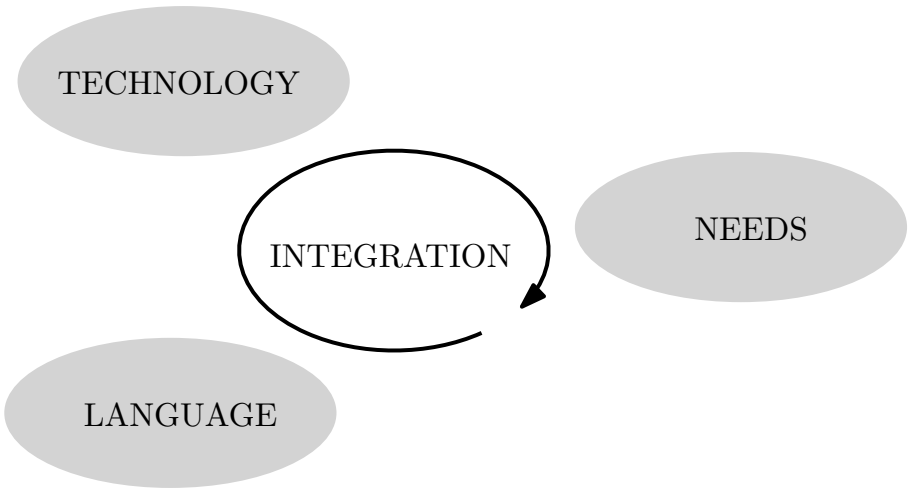

Figure 2.11. Design as the integration of technology, needs and language in Design Driven Innovation, inspired by the work of Verganti.

The output of the integration of the three elements (technology, language, needs) is meaning.

> *meaning is a structured space, a network of expected sense, a set of possibilities that enable handling things, other people* (Krippendorff, 2006, pg.50).

There are no causal relationships that could determine the meaning, but cultural constraints on alternative interpretations, including references to social habits, history, and language use, the relations with others, and the understanding of the designer who made the artefacts.

First, according to Krippendorf, defining design as a problem solving technique or a technology improvement is reductive, because this definition takes all the efforts and the commitment of designers and stakeholders involved in the projects to collectively learn from what happens with these drawings for the next round of designs. However, Krippendorff argues that in design processes it is difficult to define and identify the most appropriate relations between technological innovation and R&D activities, and need to be appropriate for defining a process that can generate aesthetic, style fitness for use and performance. Instead, Utterback et al. (2006) explain that the interrelation of engineering and design is possible in the design process by involving the creative visualisation of concepts, plans and ideas.

Second, the design process is aimed at developing an output that satisfies some needs which are unmet and cannot be expressed by the customers, who understand it and make explicit (Verganti, 2009).

Third, language, which has already been analysed in the previous paragraph. The description of the design process is not delineated in detail in

this perspective. The authors are focusing mainly on the role of designers and on the role of managers for facilitating the design driven innovation. Even if the design process appears to be the most important phase for developing a breakthrough innovation, and the idea development the most critical activity, how it happens is left to the sensibility of the designers. One of the pieces of advice that the authors give is to visualise the idea with the designers because, compared to the more traditional NPD, this process is faster. The designers have to become part of the NPD process, since they can choose the most appropriate material for the production. Since they propose a product that is radically new for the company, managers might not have enough knowledge concerning which material is the most suitable for the manufacturing process (Krippendorff, 2006). Compared to the traditional NPD (functional or engineered based innovation is grounded on more incremental or technical innovation), design driven innovation based on the semantic dimension could lead to the development of a new process for the company and to the creation of a product that is radical.
In terms of market performance, a product that is based on a reinterpretation of meaning does not necessarily gain immediate success, because customers need to understand the new language and message, connect these elements to their socio- cultural context, and transport new symbolic values and patterns of interaction (Verganti, 2009). The initial adaption of the product is slow, but it increases and then could become stable and long-lasting (Utterback et al., 2006), having a better performance in the long run than products that do not have a radical semantic turn. The product that has to take into consideration the meaning and stimulate the sense has the following characteristics:

- Useful products (utility- functionality- universal aesthetics);
- Sellable goods, services, and identities (marketability- symbolic diversity, folk and local aesthetics);
- User friendly interfaces (natural interactivity, understandability, reconfigurability/ adaptability);
- Multiuser systems/ networks (informativeness/ connectivity/ accessibility);
- Sociable projects (social viability/ directionality/ commitment);
- Broader user of products (generality / re-actability/ solidarity);

(Krippendorff, 2006)

The technology needs to exceed a critical mass of stakeholders enrolled in the project and supporting it, finding different uses for the same technology, designing them to include or exclude specifically some categories of stakeholders, and supporting with advertising the meaning creation, through narratives, metaphors, and language to explain the needed information (Krippendorff, 2006). The process is made effective when the characteristics of the product is described by elaborating or expanding the constraints, analysing and grouping the two expanded sets of attributes, generating sensory manifestations of the chosen character traits, reconciling incompatibilities in these manifestations, and testing the design and the use of language for the product (Krippendorff, 2006).

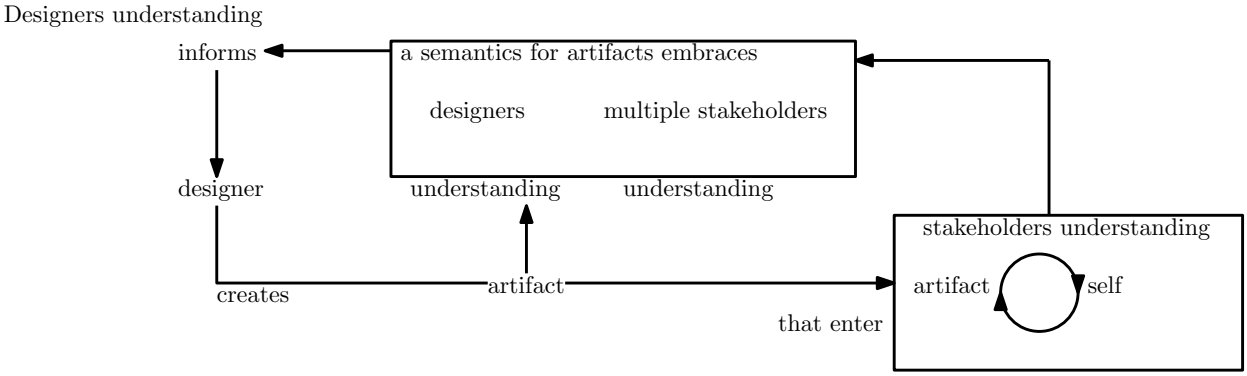

Figure 2.12. Design as semantic turn by Krippendorff (2006), pg. 63.

The design process develops narratives by explicating them into scenarios and semantics of components, exploring technical details, synthesising, realising , and finally testing them (Krippendorff, 2006). The process of building meanings continues also after the introduction of the design driven innovation process, when the design travels through networks of stakeholders and informs about its successive transformations. In the design-driven innovation, ideas from designers are the main output of the design process (Verganti, 2009) and the company chooses the design that will be realised (Utterback et al., 2006). The firm/ client is seldom involved in the generation of ideas at the earliest stage of design.

2.6.3 The role of designers

Designers are considered one of the few people with the capacity to get closer to users, understand their needs, and creatively generate countless ideas. Designers are persons who foster creativity, defined as culturally neutral, a tool

for helping to solve problems and conducting research on intrinsic meanings that can be conveyed through the product. A design driven innovation, by definition, differs substantially from the dominant meaning in the industry, and a design, from a proposal, can become a fluke (Dell'Era and Verganti, 2009). The designers are specialists, key- players in the radical innovation process. They are able to identify the changes in the socio-cultural and business field and come out with new product meanings that represent customer's unexpressed values. Designers are in charge of producing new breakthrough products that anticipate needs, and, therefore, have to recognise and sense what is contemporary (Verganti, 2008) with their superior sensitivity, because

> *the quality of goods, services and identities are not of a tangible thing. In designing goods, services, and various kinds of identities, designers are concerned with their marketability, that is, the ability to bring them to the attention of relevant populations, and with diverse symbolic qualities that encourage targeted consumer groups to acquire something, somehow, connect with a service, recognise a brand, or be committed to a seller, organisation or cultural practice* (Krippendorff, 2006, pg.8).

Design- driven innovation is based on the capability of designers to inquire into the changes of culture, society and technologies, and to make proposals to influence the emerging dynamics in the socio-cultural models (Utterback et al., 2006). A proposal is considered a vision about possible new product meanings that customers have not thought about but that they were waiting for (Verganti, 2006), meanings embedded in the design product and it conveying a message to consumers (Utterback et al., 2006).

Designers propose a vision, a product, an idea for the material suitable for the production, being careful about the client's identity, history, and geography. The company can also ask designers to act as knowledge brokers, bridging knowledge from one part to another of the organisation:

> *industrial designers may serve as a bridge not only between different clients but also between different departments within one client organisation. The designers are seen as impartial, engaged at the corporate level, and more likely to understand the different language of marking, manufacturing, and research and development- their concern is for an all- encompassing approach to the entire system* (Utterback et al., 2006, pg. 141).

Designers, having graphic capabilities, help to visualise the ideas to speed up the processes and improve the new product development:

> *an avenue involves designers in refining a promising idea from an inventor through visualisation of the inventive idea. Most often, designers come up with important additions to the original idea put forth by the inventor* (Utterback et al., 2006, pg. 141).

Designers, therefore, stimulate an innovation strategy in the company, based on an approach that foster the deeper emotional and symbolic side of products, innovating what products mean for the customers (Dell'Era and Verganti, 2009). Designers are specialists with the capabilities of understanding, anticipating and influencing the emergence of new products' meanings (Utterback et al., 2006), but also brokers, between otherwise disconnected pools of ideas. The best innovators systematically use, replace and combine old ideas in new places and contexts to create new products or services (Hargadon and Sutton, 2000), bridging knowledge and combining diverse ideas to solve the problems for different users. Designers can create breakthrough product meanings acting on the semantic dimension of a product by capturing, transferring, recombining and integrating knowledge about different socio-cultural contexts and proposing new aesthetic solutions to transfer product languages and meanings across them. Due to their ability to bridge information from different parts of the wider network they are part of (Dell'Era et al., 2010, Dell'Era and Verganti, 2009), they take advantage of discrepancies in the level of knowledge possessed by different groups, connecting unconnected expertise within a larger network. Designers are supposed to produce and present one or multiple radical design proposals from which the management can select what is considered an appropriate one, compatible with the management risk profile, understanding the target market and the relevant strategic orientations (Verganti, 2009).
Designers are proposing innovations that customers do not expect, but that they eventually appreciate (Verganti, 2009). Proposing design driven innovation means making sense of things (Dell'Era and Verganti, 2009, Verganti, 2009). The designer is aware of how to conduct a problem solving activity by applying creativity and reasoning, facilitating knowledge sharing and transferring within universities, other freelancers, companies and customers, to capture the latent and tacit information needed. After having realised the idea, the designer visualises through mock ups and prototypes, and this contributes to speed up the process by contributing to the development (Utterback et al., 2006). Thus, the designer is a person that understands, anticipates, and influences the emergence of new products meanings. The

following figure indicates which actions designers need to understand in order to deliver a radical new ideas.

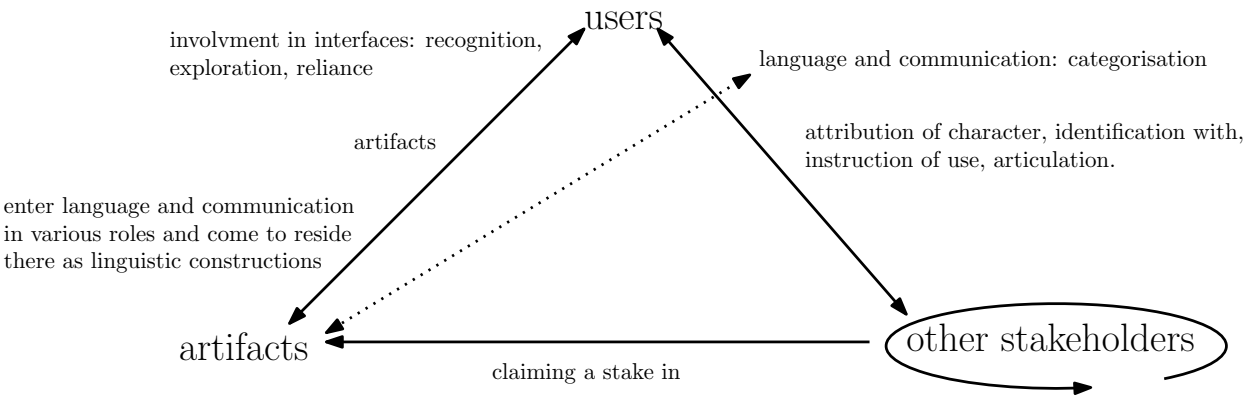

Figure 2.13. Design and meanings creation by (Krippendorff, 2006, pg. 58).

From the figure emerges the idea that meanings reside in user's perceptions and senses, and that there are different possible ways to interpret it, derived from a set of imaginable uses. These could involve past experiences, the differences with others, the composition, the material, the possible users and stakeholders. The designers are the only persons with the sensibility to extrapolate them (Verganti, 2009), but also reflect on possible negative effects in case of misuse (Krippendorff, 2006). The designers have to act and involve the stakeholders, and to negotiate their stay in the network. Stakeholders are political actors who pursue their own agendas and attempt to alter the manifestations they have access to. Acting within their own worlds, they emerge by communicating their actions. When designers propose a new idea for a new product, they have to work on realising and involving its stakeholders, because it creates a new history which challenges the current network. Therefore, the stakeholders' networks need to be reinstitutionalised, energised into structures and be provided with instruments to understand the meaning (Krippendorff, 2006). Relevant and competent stakeholders are invited to contribute, and this could establish and potentiate the product' s credibility. The managers are also bringing socio-cultural researchers in the network, as well as marketing experts to help with the construction of narratives to facilitate the designers' task . There are no causal relationships that could determine the meaning of an artefacts, but there are cultural constraints on alternative readings, due to to social habits, social context, history, and language use (Dell'Era et al., 2010). Therefore, designers create a hermeneutic circle, in which the meanings of an artefact depend on the meaning of its arrangement, and the meanings of its arrangement depend on that of its parts. One way in which the designers align the interests of the

different stakeholders in the initial phases is by following the idea, explaining the support he/ she needs in the network, explaining and negotiating conflicting perspectives, their stake in the technological development, bringing them in their expertise, and convincing them to act in support or opposition of that development, by mobilising the resources they have. Verganti (2003, 2009) and Krippendorff (2006) describe the motivations of designers as them being motivated not by a quest for knowledge for the knowledge' s sake, but by the challenges, vexatious situations, problems, and conflicts that are hard to solve, inspiring them to look for opportunities to change something for the better, to contribute to the lives of human beings, for opportunities to introduce modifications to the world that others may not dare to, in the hope of creating something new and exciting with a scope and a use. Designers have the capacity of not being concerned with what already exists, but they are aiming instead at exploring possible futures that could be created in real time, evaluating the desirability of these futures (Dell'Era et al., 2008b). Designers act according to implicit and explicit motivation. Concerning the extrinsic motivations, they justify actions by defending the goals that have to be reached, tasks to be completed, while intrinsic motivations justify actions on their own terms, such as substantial amounts of user autonomy, multiple sensory- motor coordinations, and continuous learning (Utterback, 2006). The designers are equipped with intellectual tools allowing them to imagine what did not exist before, to introduce desirable changes to the world, and to work at having positive technological, social, and cultural consequences (Krippendorff, 2006). Designers have also to ensure the validity (experimental, interpretative, and methodological) of a product to the managers, explaining to them the possible feasibility of paths from the present to alternative futures (Krippendorff, 2006).

> *What is peculiar in design-driven innovation is that designers act as brokers of knowledge on languages and not just on technology. Language brokering is even easier as product languages are not industry specific: They move across industries more fluently than technology* (Verganti, 2008, pg.451).

Designers create feasible paths from the present towards desirable future and propose them to the managers and the stakeholders, who are able to realise and put it to a test (Krippendorff, 2006). Because design can travel between different sociocultural worlds, this is a complex process, as design is also culturally embedded.

2.6.4 The role of management

The management activities in this perspective are focused on the identification and nursing of one or more visionary and knowledgeable specialists (designers). The role of designers is depicted in the book by Verganti (2009). Managers are persons with a highly differentiated knowledge (social, political, organisational, economic and technological), and they need to be able to create the conditions for certain technologies to arise. Managers applying design driven innovation are aware that they should not simply follow the existing trends. They are making proposals with which they will modify the context, using designers as interpreters pursuing their own investigations and engaged in a continuous dialogue. Managers have to involve consultants that act as knowledge brokers, select design suitable for the firms, nurture long- lasting relationships with the designers, and develop its own research path. The challenge of managers is to identify the suitable designers able to connect with the firm and the market, to choose the most appropriate design consultant and to manage the organisational design (Verganti, 2009). Design managers also deal strategically with brand identity and communication and choose a distinctive mark, sign or name. Managers, through the designers, gain a new insight into the individuals and in the communities, and obtain access to technology, know how, education networks of commitments and market competition (Krippendorff, 2006). They are aware that they are managing a firm which hold a central position in a network of stakeholders:

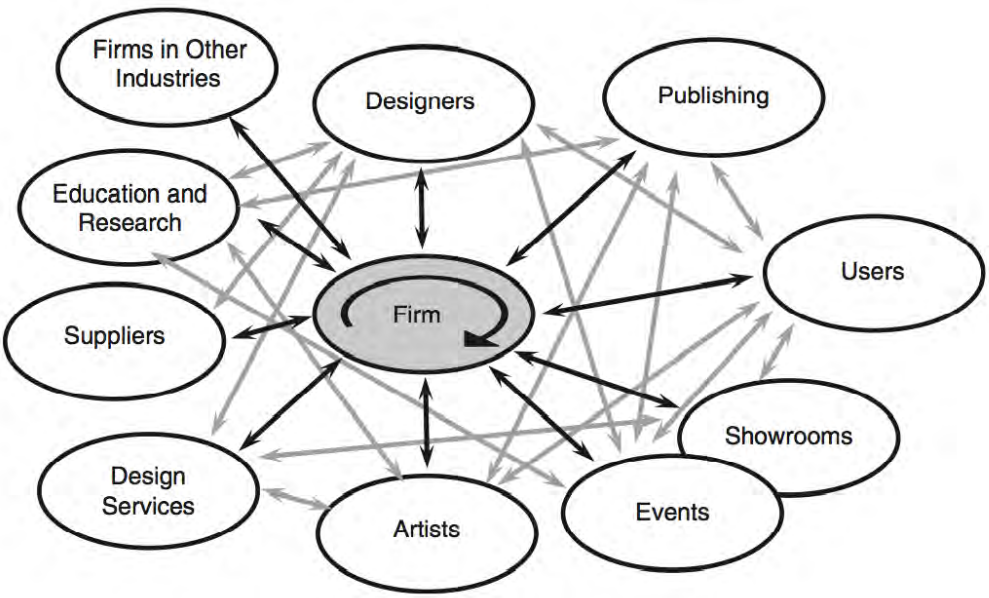

Figure 2.14. The design discourse surrounding a firm in Verganti (2008), pg. 444.

The figure visualises how Verganti (2008) defines the design discourse,

as a collective research process on meanings and design languages and its implications on patterns occurring through several explicit and tacit interactions among several actors, both in the global and local setting, working to find creative solutions and to share knowledge within the design discourse and throughout the key interpreters:

> *interacting with the design discourse to access knowledge on product languages is not sufficient for design-driven innovation. A firm also needs to interpret this knowledge, to select important stimuli and disregard others, to interiorise it, and finally to develop its own unique vision and language* (Verganti, 2008, pg. 452).

In the article by Dell'Era et al. (2008a), it is suggested that managers have the role of capturing, understanding and developing socio-cultural trends by participating in events, fairs, networking, and discussions with other companies and associations. Managers are the people proposing and deciding on the designer selection, inviting the internal designers to a dialogue with the external designers, involving and asking for feedback and suggestions from socio-cultural researchers and product developers (compared to other innovation processes, they cover marginal roles during the scenario development). The authors claim that the use of external designers is preferable, because the company must meet the challenge of guaranteeing a certain degree of innovativeness in its offering, and ideas must be independent from of company constraints. In this scenario, the innovation process is centred on the competencies of managers, who control most of the activities (Dell'Era et al., 2008a). The managers go from being a central figure of the decision making process to multidisciplinary persons, able to have a dialogue with different stakeholders. Managers, in order to foster radical innovations through design, should not start from the market and use traditional market approaches, or user centred technique, but should create a prototype or a product and then test it on a focus group. The traditional market tool that suggest for a technology push or market pull approach are very seldom produce radical innovations (Dell'Era et al., 2010, Verganti, 2011), while a combination of design push and technology push tools should be used to achieve breakthrough innovation, as Dell'Era et al. (2008a) have visualised in this graph:

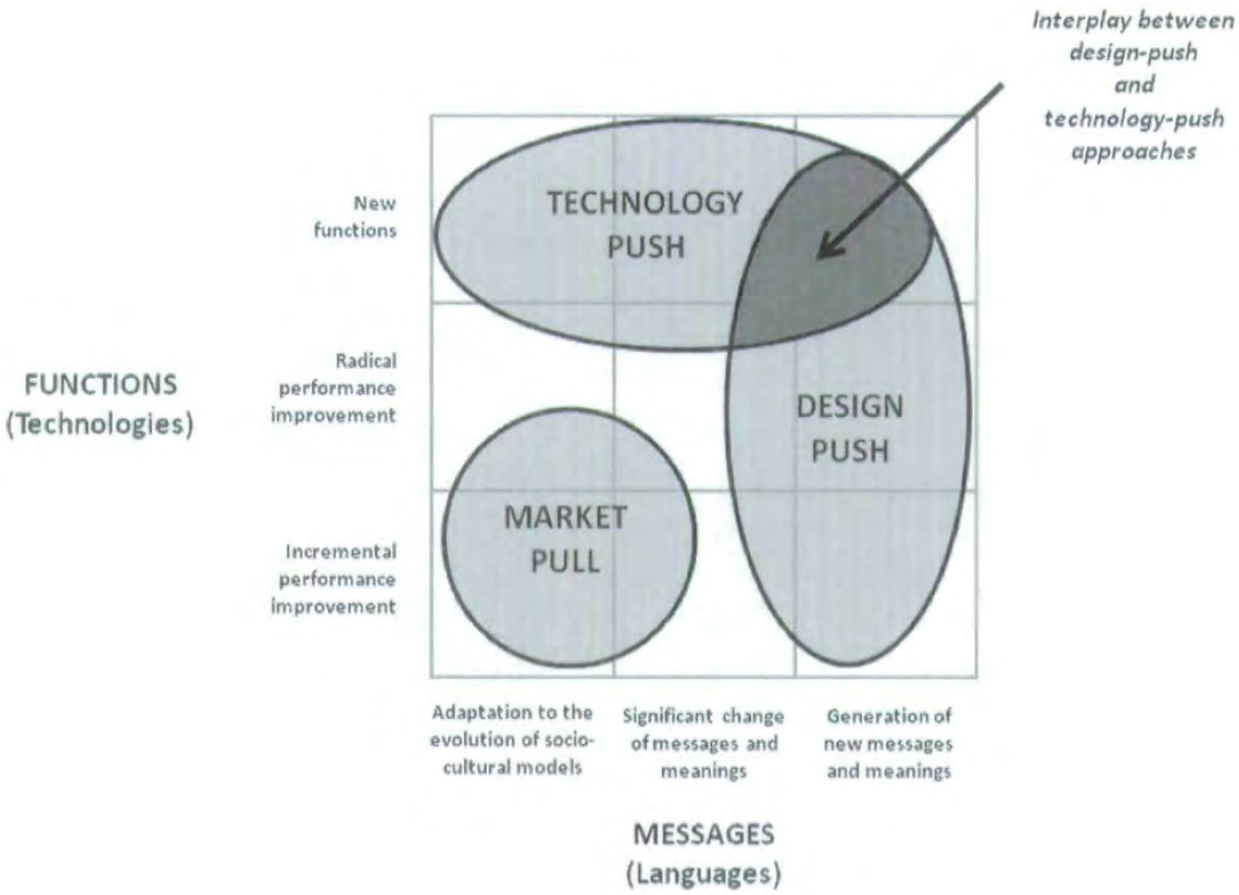

Figure 2.15. Market pull, technology push and design push; (Dell'Era et al., 2010, pg. 14).

Managers are the facilitators able to identify the best designers for the company, facilitate their work in the company and support the new product development process, by suggesting how to use design driven innovation.

2.6.5 Value creation

Value is created when the firm delivers a product to the customers that has a better design, performance, quality and experience (Utterback et al., 2006). Value is created by adding a final aesthetic to a product which conveys new meanings, defined by its emotional and symbolic value, a system of values, a personality and identity, which may easily go beyond the style (Verganti, 2009). The meaning in products is a link between the social aspects, specific languages, sets of signs, symbols and icons associated with the product (Verganti, 2008). The value of using design driven innovation is asserted to the increase of the profit by increasing sales or by decreasing manufacturing costs, conquering the market share, increasing the competitive advantage,

and revamping the mature and failing products.
Verganti (2009) demonstrates that managers can direct their personal and firm based culture toward the creation of economic value. The value created for the customers is reflected into the increase of value at the level of corporate image, including brand, stationery, publications, exhibitions and web design. The value also lies in a chain composed of design firms, materials, suppliers, machinery and possible subcontractors for manufacturing (Utterback et al., 2006). The meaning that is attributed to a product by a user departs from the user's cognitive model that is affected by his/her sociocultural context. The value increases when the meaning is understood and anticipated, influencing the sociocultural context that it targets, and the integration of different semantics is happening.

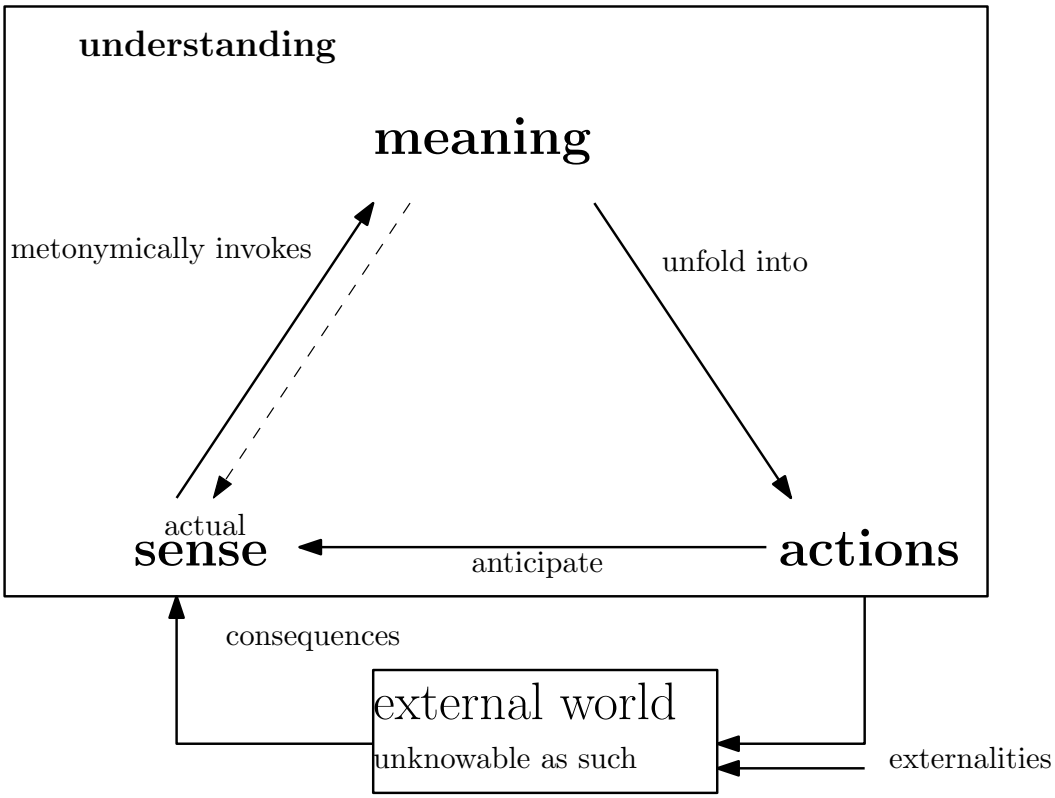

Figure 2.16. Value creation through semantics based on Krippendorff (2006), pg. 67.

2.6.6 Technologies of Managing

Krippendorff (2006) proposes the constitution of a science for design in order to increase the manageability of the design process and improve the language of practice of design, its capacity to generate new proposals, and to present them to the relevant stakeholders, and to institutionalise the design discourse (Dell'Era et al., 2008b, Krippendorff, 2006). Science for design is defined as

> *a systematic collection of accounts of successful design practices, design methods, and their lessons, however abstract, codified, or theorised, whose communication and continuous evaluation within the design community amounts to the self- reflective reproduction of design practices. It also includes ways of consulting related knowledge bases in support of particular design decisions and project research. Its aim is to keep design discourse viable and productive* (Krippendorff, 2006, pg. 35).

This statement declares the aim of the researcher to include new possibilities to make design more productive, to develop several levels of approaches to meaning in design, and to formulate reproducible design methods for human-centred design. In order to recognise the potential value of a technology and to adapt it to disparate products, designers must be familiar enough with a technology to generate analogies appropriate for current designs.
In the following section a series of techniques used in the process are presented; they are extracted from Verganti (2008), Verganti (2009); Krippendorff (2006)

Tools to stimulate creativity brainstorming, storyboarding, focus groups, customers observation, surveys, market tests with several prototypes, and a deep analysis of current and future competition to define the most valuable elements in customers perceptions and experiences.

Tools for increasing the speed of the NPD visualisation and modelling, prototyping, narrative- prototyping, visualisation, lingua franca, metaphor, imaginary as products, tension with creativity, creative arts.

Tools for measuring the stage of PLC Designers can make improvements on the products and on the aesthetics, since the life of artefacts can become quite complex, but is not entirely intractable. There are incremental improvements done that could be simple improvements of artefacts already known by the engineers, innovations that combine technical knowledge of different aspects, and resolve a technical contradiction, inventions that combine knowledges from different areas in which an artefact is to operate, or invention of a structurally new phenomenon that pushes an existing technology to a higher level: market researchers, advertisers and sales persons are involved, searching for profitable markets and advising designers. Designers are intervening within the stakeholders' network to transform it, making the design alive. The tools that can be used are additionally to the creativity

and include reframing (similar to brainstorming, but it focuses on multiple ways of understanding an often intractable situation to try out one or more of the following cognitive devices) transforming the known, using alternative metaphors, finding analogies of a given situation, employing various theoretical perspectives, eliciting various stakeholders' conceptual frameworks and translating a problem or design into different media for conceptualisation.

Tools for understanding and the stakeholders' interests These tools are used to understand which are the interests of stakeholders and how to prepare a program of action for keeping them interested in the product. The tools are narratives of ideal futures, surveys and structured interviews, unstructured interviews, focus groups, observational methods, protocol analysis, ethnography and triangulation of methods.

2.7 Summary- Fourth perspective

The following figure represents the most recurrent words in the fourth perspective. They are calculated among all codes individuated for the co-word analysis

Figure 2.17. Recurrent words in the 4th perspective.

The following table summarises the elements in this perspective

Design definition	The etymology of design goes back to the Latin *de + signare* and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners or goods. Based on this original meaning, one could say: design is making sense of things.
Design Process	The process is aimed at creating a meaningful radical product, and the meaning drives every phase of the NPD. The process is successful when there is an integration between customers' needs, technology and language.
Role of Designers	Designers are the only people able to understand the unmet needs of society, so they have to understand them, to make them explicit in the idea development phase, and to present companies radically new products, which have semantic turn.
Role of Management	Managers have the role of capturing, understanding and developing socio-cultural trends by participating in events, fairs, networking, and discussions with other companies and associations. Managers are the persons proposing and deciding on the designer selection, inviting the internal designers to a dialogue with the external designers, involving and asking feedbacks and suggestions to socio-cultural researchers and product developers (compared to other innovation processes, they cover marginal roles during the scenario development).
Value Creation	Value is created when the firm delivers a product to the customers that has a better design, performance, quality and experience. Value is also created by adding a final aesthetic to the product, which conveys meaning, defined as its emotional and symbolic value.
Technologies of management	Tools for increasing the manageability of the design process and improve the language of design practices.
Principal Authors	Utterback et al. (2006), Verganti (2008), Verganti (2009), Verganti (2003), Dell'Era et al. (2008b), Verganti (2008), Dell'Era and Verganti (2007), Verganti (2011), Dell'Era and Verganti (2011), Dell'Era and Verganti (2009), Dell'Era et al. (2010), Krippendorff (2006).

Table 2.6. Summary-Fourth perspective on Design Management: Design As Proposals Of New Meaning.

2.8 Conclusion Perspectives on Design Management

This chapter aimed at answering the question: *How can different perspectives on management of design be identified? Which are the past and the present perspectives on design and on management of design?* Creating a literature is not a fixed and linear process, but it is an extremely interactive process that has also been modified by the refinement of the research questions, the analytic process and the discussion. The steps that were presented, however, were fixed steps that were used as checklist for the writing process. In the following tables, a summary with the characteristics of the literature review is presented.

	Design for decision making process	Industrial Design	Managing As Designing	Design As Proposals Of New Meaning.
Design definition	Design is the science of the decision making process, a process of problem- solving	Design comes from the Latin *designare*, which is translated into English both as the noun design and the verb to draw, to plan.	Managing as designing means the monitoring, containing, and reversing of compounded abstraction	Based on this original meaning, one could say: design is making sense of things.
Design Process	The rational decision making is selecting an alternative	Stage- Gate model	Design thinking	Creating a meaningful radical product.
Role of Designers	Designers plan determined courses of actions or artefacts	creativity, problem solving, observation, interpretation, aesthetic judgment, stretching	Designers are inspirational for managers	Designers understand the unmet needs of society.
Role of Management	Creating and developing the decision making process	Choosing the designer able to complete the NPD and the most appropriate form of design of the organisation	Idea generator who give form to the new possibilities	Capturing, understanding and developing sociocultural trends, proposing and deciding about the designer selection.
Value Creation	Process of reduction to declarative logic, optimisation process	Higher price, lower production cost, better company image, emotional, symbolic and relational value	Valuable and sustainable workflow, attention to competitors and changing situations	Product with a better design conveying meaning, emotions and symbolic value.
Technologies of management	Enabling the recognition of what is inside and what is outside the systems	used for market observation, segmentation; monitoring production and quality	Different organisational structures	Managing creativity and understanding unmet needs.

Table 2.7. Summary table: Comparison of the perspectives in Design management.

In this chapter, a new technique for the field of management of design for identifying the perspectives in management of design has been used: the co-word analysis. The co- word analysis was performed to examine how to describe the development characteristics among the different perspectives in design management. This research area has not received much attention. Atwood et al. (2002) have used the co-citation method to study the development of the design management field, but some critics have been opposed to this method, arguing that the mechanical way of doing literature review is leaving out and not capturing the complexity of the phenomenon. Instead, the co-word analysis is based on the paper by Rip and Courtial (1984), who have implemented the method based on key words and to focus on analysing the content and creating the keywords, without using the one provided by the articles, because they are not mirroring the content of the paper. The way they have analysed the field of biology was used as inspiration for the analysis of the field of design management. Cobo et al. (2011) suggested utilising the co- word analysis for an appropriate representation of the dynamic in the field.

The coding of the arguments is justified by Callon et al. (1986), Latour (1987): the fate of what we say and make is in the later users' hands.

From the co-word analysis and the calculation of the Jaccard index, three perspectives emerge: the first perspective was added after having coded the articles, reflecting that the argument of the second and the third perspectives were based on the studies of Simon, (1969); therefore, a new perspective was added based on this reference. The list of codes used for the analysis is in Appendix A. The second perspective is a linear perspective, based on the SGM, aimed at integrating the design into the NPD for making the product more efficient and sell at higher value. The method of investigation ranges from case studies to surveys.

The third perspective explores the complexity of the management and the challenges that managers have to face for building an organisation that is capable of producing value for the society.

The fourth perspective is investigating how to create a radical innovative design product that is able to satisfy the unmet needs of society. In order to create a new meaningful product, the designers have to understand the evolution of the socio-cultural contexts.

3

An emerging perspective: Understanding Design with ANT

The purpose of this chapter is to introduce Actor-Network theory (from now on, ANT) as an emerging perspective of management of design. Among all the authors and concepts discussed in the literature of ANT, the focus is mainly on the works of Latour. In this chapter, the concepts crucial for the analysis and for the understanding of the management of design using ANT as a framework are presented. The aim is to term the fluidity of concepts in ANT, with the intention of entering into its discourse and its use, to construct an approach to management of design that does not distinguish a priori between designers and design and that considers human and non-human actors equally important, working together to support the fate of the design (Callon et al., 1986, Latour, 1999). This would lead to answer the stated problem: *how does a design product emerge if it considered and understood as a network effect, and what are the managerial implications?* through the understanding of the micro- processes that lead to the emergence of the design.
The chapter is constructed on a process of negotiations among the literature, articles, disciplines, practitioners, academics and critics, and it is my intention is to be an actor in this negotiation process and to contribute to the field, following their arguments,

> *weaving through things they have added to social skills so as to render more durable the constantly shifting interactions* (Latour, 2005, pg.68).

The following sections are written with the intention of crumbling the selected ANT books and articles investigating their philosophical construction.

There is not a succinct distinction between ontology and epistemology: one of the main roles of this sociological approach is to problematise, and this act prorogues the separation of epistemology from ontology. Actors come into existence by descriptions presented in the narratives created in the laboratories by other actors and elaborated by the researcher, therefore the boundaries between epistemology and ontology are blurry. This concept is explored in Latour and Woolgar (1979); the authors define the laboratory as

> *the organisation of persuasion through literary inscription* (Latour and Woolgar, 1979, pg.88).

Hence, the dissertation is not only a linguistic operation, but the translation from one mode of existence (such as newspaper article) to another one (such as data for the analysis).

This chapter aims at answering the research question: *how can management of design be understood through the lenses of ANT?* In order to answer to this question, the chapter has two main sections: philosophical negotiation (section 3.1) and understanding design using ANT as a framework (section 3.2). The philosophical section (section 3.1) clarifies the concepts of metaphysics, essence and ontology in ANT to give an articulated understanding of the use of ANT as methodological framework in management of design, in order to grasp the differences with the previous perspectives that are based on the assumption that the world is "out there" and not an effect of a construction. The section has been divided into two main parts: experimental metaphysics and ontology, essence and substance, which are fundamental understandings to apply to the management of design field, because

> *a central tenet of actor- network theory, adopters from ethnomethodology is the need to respect the metaphysics of the actors one is studying* (Latour et al., 2011, pg. 6).

In the second part, the understanding of management of design opened up in chapter 2 is analysed through the lenses of ANT. At the end of the chapter, the analytical framework is presented (section 3.3). The analytical framework consists of the presentation of the key concepts of ANT used in the analysis, and each introduced concept is followed by a definition of the term given by Latour and a clarification about the usage to answer to the research question.

3.1 Philosophical negotiation

This section is called philosophical negotiation and not foundation. The word foundation has been appositively avoided in order to not be labeled as reductionist, trying to deduce or build explanations. Instead, this is the result of the negotiation processes with different actors, including books, notes, dictionaries, and discussions with colleagues and professors. As methodology theory, ANT considers reality as relative and co-constructed, existing only within the network and in the translations. For this reason it has been indicated also as sociology of translation (Callon, 1986).

> *Like Michel Serres, I use translation to mean displacement, drift, invention, mediation, the creation of a link that did not exist before and that to some degree modifies two elements or agents* (Latour, 1994, pg.32).

The non-human actors acquire legitimacy, they are active actors constantly working with the human actors to stabilise reality. ANT is based on three principles: agnosticism, generalised symmetry and free association. Agnosticism means that the observer has to be impartial towards the technological arguments used by the actors, not being allowed to censor them when they speak about their networks (Callon, 1986). This implies abandoning any preconceived assumptions of causal relationships, nature of the networks or the accuracy of the actor's explanations.
Generalised symmetry implies the treatment of humans and non-humans in the same manner when the researcher moves from the technical to the social aspects of the problem, not privileging the analysis of humans over the analysis of non-human actors (Callon, 1986). Free association requires that the observer abandons the division between society and nature in the analysis, since society, nature and technology are not two ontologically distinct entities (Latour, 1991, 1999).

3.1.1 Experimental Metaphysics

The term metaphysics has an accidental origin - *tá metá tá physiká*, which means the books "following that one of the physic", titled by the Aristotle school. They were 14 books dealing with the first philosophy, considered the supreme science among the theoretic sciences (the other two are sciences, the physics and the mathematics, were considered subordinated)[1].

[1] from the book Metaphysics, Aristotle

It has two main scopes of investigation: the being and the supersensitive. According to Aristotle, metaphysics is the doctrine of pure act, concerned with explaining the fundamental nature of being and the world, the notions of existence, objects and their properties, space and time, cause and effect and possibility. Latour takes into account Aristotle's position, and he is approaching metaphysics by defining it as a method to look at reality and get new insights (Latour et al., 2011), respecting the shifting ontologies, and the generalised symmetry. He defines metaphysics as experimental metaphysics because it is what assembles the world:

> *metaphysics is traditionally defined as what comes after or above physics, thus presupposing an a priori distribution of primary and secondary qualities that settle the problem of the common world, the object of this book, too quickly. To avoid this premature solution, I call experimental metaphysics the search for what makes up the common world* (Latour, 2009, pg. 242).

The study of metaphysics is a method that allows the tracing of more problematic entities that are not looked for, and is suitable for questioning reality since it has been gripped away by the social explanations (Latour, 2005). Therefore, the concepts analysed in this section are irreduction, actors and translations.
According to Latour, studying a translation is important to understand what an actor is, how it emerges and its mode of existence: it is because of the irreducibility that the translation (or a chain of translations) is made visible, that mediation is becoming researchable, and it is possible to study it by looking at the traces left by the actors (Latour, 2005):

> *it's actually because of the irreducibility of the space that you have to get into connections, that translation is made visible for the social sciences, and that the task of mediation is visible* (Latour et al., 2011, pg. 43).

The length of translation is variable and depends on the changes of the relations and their mode of existence. Latour (1988) describes the fact that no actor is inherently irreducible to another actor, but it could be explained in terms of other actors, by transforming into something else with a chain of equivalences. Indeed, nothing is, by itself, irreducible to anything else, but there are only trials, and whatever resists the trial is real (Latour, 1988, pg. 158). The world is built upon relations, based on connections with other entities making networks. Actor- Network theory cannot share the

philosophy of causality used in social sciences (Latour, 2005), but it explains that the relations are the reality:

> *every time some A is said to be related to some B, it's the social itself that is being generated* (Latour, 2005, pg. 103).

Actors are mutually external entities, independent from each others, and they communicate through translations and interfaces in order to enter in contact. They are entities insofar as that when they act, they bend the space around them (Callon and Latour, 1981). The relations between non-human actors are not metaphysically different from the one between human actors or human and non-human actors. The reality is nothing but actors embedded in their relationships, and events are taking place in each instant free of potency (Latour et al., 2011). Nothing is known, only realised (Latour, 1988, pg. 159). This implies that there is no universal or a priori knowledge, there is no time in the sense of elan or duré, or in flux of becoming distinct from the reality, which can last if actors can relate, if trajectories and/or vectors can move across time and a series of minute transformations, making time formed of instants, unique events that are not connected and that do not last automatically from one moment to the next (Harman, 2009a). Trajectories are described in Latour (1991) as the work of the spokesperson in transforming the network

> *by cutting across the translation, the notion of trajectory invents surrealist "cadavres exquis"*[2](Latour, 1991, pg. 114).

This means that an actor transporting the information is necessary to make the trajectory and the translations visible. This problem has been solved by Latour declaring the existence of mediators that transform information. However, by affirming this, there is the risk that all the translations transform and transport at the same time; a risk that is reduced by the presence of the immutable mobiles that can transport information without deforming it, circulating everywhere and in all the directions without changing it (Latour, 1990). At pg. 19 in Latour (1990), a list of characteristics of immutable mobiles is provided:

> *they are immutable when they move, or at least everything is done to obtain this result, (...) they are made flat (...), the*

[2]Exquisite corpse, also known as exquisite cadaver (from the original French term cadavre exquis) or rotating corpse, is a method by which a collection of words or images is collectively assembled. Each collaborator adds to a composition in sequence, either by following a rule, from wikipedia, 27th January 2014

> *scale of the inscriptions may be modified at will, without any change in their internal proportion, (...) they can be reproduced and spread at little cost, (...), since these inscriptions are mobile, flat, reproducible, still and of varying scales, they can be reshuffled and recombined, (...) one aspect of these recombinations is that it is possible to superimpose several images of totally different origins and scales (...)*(Latour, 1990, pg. 19)

According to this description, they are substance.
The metaphysics in ANT allows for the study of not only the resulting construct, but also of the heterogeneous elements participating in the construction (Latour, 2003) by investigating how the actors have been connecting, shaping the network, acting and creating value within the relations. The role of non-humans has to be analysed as well, because studying and taking them into account is what has been missing in the previous sociologies:

> *according to some physicists there is not enough mass in the universe to balance the accounts that cosmologists make of it. They are looking everywhere for the "missing mass" that could add up to the nice expected total. It is the same with sociologists. They are constantly looking, somewhat desperately, for social links sturdy enough to tie all of us together or for moral laws that would be inflexible enough to make us behave properly. When adding up social ties it does not balance. Soft human and weak moralities are all sociologists can get. The society they try to recompose with bodies and norms constantly crumble. Something is missing. Something that should be strongly social and highly moral. Where can they find it? Everywhere, but they too often refuse to see it in spite of much new work in the sociology of artefacts.*
> *I expect sociologists to be much more fortunate than cosmologists since they soon will discover their missing mass. To balance our accounts of society we simply have to turn our attention away from humans and look at non-humans. Here they are, the hidden and despised social masses who make up our morality. They knock at the door of sociology requesting a place in the accounts of society as stubbornly as the humans masses did in the nineteenth century* (Latour, 1992, pg. 227).

Some years before this text, Latour wrote an article using the nickname of Jim Johnson (Johnson, 1988), in which he proposes the *hole-wall* dilemma. Johnson, aka Latour, affirms that sociology is not the study of

social questions, but the study of associations of humans with non-humans. To strengthen his point, Johnson analyses a common non-human actor: the door-closer, and he sustains that this technical artefact deserves consideration and has to be regarded as highly moral and social. Non-human actors are fundamental in the analysis, since they *displace or translate or delegate or shift* (Latour, 1992, pg.229) actions that are proper of human actors to translate properties and make them acting.
Latour (1991) describes the struggles of the hotel owner to not lose the keys of the rooms of the hotel. The hotel owner would like the customers to leave the keys at the reception. He tries to rely on their courtesy, but they do not respect his order. He starts to use some non-human actors (like writing the order on a piece of paper in the entrance) but he does not succeed. He is able to successfully enrol the clients in his program of actions, when he inserts a non-human actor: a weight on the key. This non-human actor is able to make the customers acting how the hotel manager wished: the clients are acting not because they decide spontaneously to do that, but because they react to a program of action imposed by a non-human actor. Humans and non-humans are in any case very undisciplined in their actions, no matter of how much effort or predetermination the actor who wishes to obtain a certain behaviour puts into it (Johnson, 1988). Therefore, humans inscribe in the non-human actors properties to delegate actions. Human actors, together with non-human actors, are designing the object and enforcing a program of action on it, but it is not guaranteed that the other actors interpret the inscriptions and act according to their interpretation (Latour, 1992, pg. 239). During the process, human actors delegate their activities to non-humans, but they also tend to "anthropomorphise" them:

> *the groom is indeed anthropomorphic, in three senses: first, it has been made by humans; second it substitutes for the actions of people and is a delegate that permanently occupies the position of a non-human; the third, it shapes human actions by prescribing back what sort of people should pass through the door. And yet some would forbid us to ascribe feelings to this throughly anthropomorphic creature, to delegate labor relations, to project- that is to translate- other human properties to the groom* (Latour, 1992, pg235).

The behaviour imposed to the humans by non-humans is a prescription (Johnson, 1988). Prescription is defined by Akrich (1992) as notice, contract, advice that accompany the piece of technology to help to predetermine the settings that human actors are asked to imagine for it. This is the result

of inscription, that is the work that human actors are doing to inscribe values and technology into the technical content of the object (Akrich, 1992). Therefore, actors participating in the design process are aware that their inscriptions create prescriptions. In all this movement and delegation, the non-humans are framing the energies that should be used by humans to do the same task, and they are able to withdraw energy from a reluctant human involved in the action (Latour, 1991, 1992), and their identities and goals be negotiated and translated.
In ANT, the associations are the fulcrum of the study, and this brings to study more specifically the world inscribed on the object and the world described in the displacement. The inscriptions are not happening a priori, but are contextual (Grint and Woolgar, 1997). Latour indicates that *the point is not relativism but relationism* (Latour, 1991, pg.128), and what is worth analysing are the relationships between the social and the technical (Akrich et al., 2002a):

> *to do this we have to move constantly between the technical and the social. We also have to move between the inside and the outside of technical objects. If we do this, two vital questions start to come in focus. The first has to do with the extent to which the composition of technical object constrains actants in the way they relate both to the object and to one another. The second concerns the character of these actors and their links, the extent to which they are able to reshape the object, and the various ways in which the object may be used. Once considered in this way, the boundary between the inside and the outside of an object comes to be seen as a consequence of such interaction rather than something that determines it. The boundary is turned into a line of demarcation traced within a geography of delegation, between what is assumed by the technical object and the competences of other actants* (Akrich, 1992, pg. 206).

Latour affirms that shifting the focus from metaphysics to ontology is to uprise and challenge the idea of how the real world really is (Latour, 2005), and it is necessary to understand the different agencies, actions, ontology, essence and reality by studying the translations occurred.

3.1.2 Ontology, Essence and Substance

Ontology comes from *onto-*, from the Greek "being; that which is", present participle of the verb, eimi "be", and *-logia*: "science, study, theory" and is

the philosophical study of the nature of being, becoming, existence, or reality, as well as the basic categories of being and their relations. Traditionally listed as a part of the major branch of philosophy known as metaphysics, ontology deals with questions concerning the existence of entities. In western philosophy, essence has been a vehicle for individuating different forms of existence and different identity conditions. The concept comes from Aristotle, who used the Greek expression *to ti en einai*, literally "the what it was to be", or sometimes the shorter phrase *to ti esti*, originated from the word *ousia*, literally "the what it is", for the same idea. In Latin, it was translated into the word *essentia* (English "essence"). The definition indicates what makes something to be what it is, instead of something else, and it necessarily has that attribute in order to not lose its identity. Essence is opposed to accident: essence indicates what is necessarily proper of an entity, what makes the substance retains its identity, whereas accident is what is proper of an entity contingently. This means that the other characteristics that are proper of an object can change in time, without modifying and transforming the essence:

> *purposeful actions and intentionality may not be properties of objects, but they are to properties of humans either* (Latour, 1994, pg. 46)

Previous perspectives on management of design are based on the platonic and post-platonic framework, in which concrete beings acquire their essence through their relations to forms, which are defined as abstract universals, while the qualities are eternal in object and they do not change (Abbagnano, 1968)[3]. Latour heavily criticises the essentialism philosophy (Latour, 1999, Latour and Porter, 1996).
According to essentialism, any specific entity has a set of incidental attributes, which are necessary to its identity and functions, and through them is possible to know the object/ the persons, because it has an uniquely knowable character that makes it recognisable and acknowledgeable.

> *The existentialism (extended to things!) provides a precise content to the distinction between the questions of rhetoric (or packaging) and substantive questions. Network analysis has been widely criticised for transforming scientists into washing machine salesmen, people constantly worried about rhetoric and enrolments and very little concerned about the content of their discoveries. (...)The analyst should never predetermine the weight of what*

[3]see the book teeteto

> *counts and what does not, of what is rhetoric and what is essential, of what depends on Cleopatra's nose and what resists all contingencies. The weight of these factors must be calculated as a function of the movement of syntagms and they will be different in each story* (Latour, 1991, pg. 115- 116).

Therefore, ANT is positioned in the anti-essentialism in which a shift happens from a theory of network to a philosophy of modes of existence. In the recent years, ANT has been developed further, towards the post essentialism, which is

> *anti- essentialism with added intention of interrogating/ trying to escape (inevitable assumptions about essence)* (Woolgar, 2013, slide 4).

Acknowledging the existence of a post ANT, its position is not taken into consideration in this dissertation. The thesis is based on the belief that

> *essence is existence and existence is action* (Latour, 1994, pg. 33)

In ANT, agencies are shared in the networks, and an actor becomes what it is because it modifies the qualities/ features through different relations (Latour et al., 2011). Therefore they are not stable, but changing and dependent on the relations that are formed. The qualities (in the analysis described for indicating the values) are not enduring substances, as Plato asserted, but they are perpetually modified. However, in ANT there is a reflection on the qualities, which are

> *a traditional expression in philosophy to distinguish the fabric of which the world is made (particles, atoms, genes, neurone, and so on), as opposed to representations (colours, sounds, feelings, and so on); primary qualities are invisible but real and never experienced subjectively; secondary qualities, visible but nonessential, are experienced subjectively. Far from begin on obvious division, it is the operation of (political) epistemology par excellence that is undone by experimental metaphysics* (Latour, 2009, pg. 247).

Therefore, qualities are made in the relations and they influence the way actors interact, form networks and alliances (Latour, 1999), and Latour calls qualities features (Latour, 1999). It is not well explained, perhaps because feature is a more comprehensive term, embracing both the primary and the

secondary qualities, and it is assumed that the features, through the qualification process, become qualities. In ANT's world, reality is, thus, co-constructed through relations, and any change, small or consistent, modifies the way that actors are interrelated to each others, changing also their own nature. There are no differences between the real, the unreal, the possible and the imaginary, while the differences can be ascribed to experiences between those who resist or do not resist (Latour, 1988, pg. 159).
There is not such a thing as an objective reality, facts are not "just" out there waiting to be discovered; but, the focus on investigation should be on what is related/ unrelated, and as long as other actors relate to the actor, it is considered real (Akrich, 1993), and the distinction between subjective and objective becomes meaningless. Actors are absolutely concrete entities and without the relations they are utterly cut off from the existence. The real is not one thing among the others, but rather gradients of resistance (Latour, 1988).

> *There is no cryptic reservoir hiding behind what the thing is doing here and now, what qualities it has here and now. The reality of the actor is its way of perturbing, transforming, and jostling other things* (Latour et al., 2011).

Actors are fully deployed in the world (Harman, 2009a). Even if actors are related and are constantly relating to construct their reality, they keep a certain privacy that allows them to remain intact and distinct (Latour et al., 2011).
Since reality is defined as the presence of units related to each other, the nothing is intended simply as the absence of relations. Reality is constituted in the network, and if there is an out-thereness, then it is an out there beyond the network constituted by other networks.
Actors are concrete and real entities, with a defined full set of features, but lacking the inner kernel, and are instead formed by a substratum of relations, alliances and peripheral accidents (Harman, 2009a). Existence is not an inner immutable essence that is framing them, since it is not sealed within the actors, but rather a substance they can convey (Latour et al., 2011). Actors are semiotic entities (Latour, 1987), and performative (Latour, 1999), in the sense that they are defined by their performances (Latour, 1987). Not only human but also non-human actors acquire an ontological status and an agency to act, gaining the same ontological foothold: actors are everything that has an effect on other things due to their relations (Latour et al., 2011). Non-human actors are at the same level as human actors, without being minimised to ontic presences, and they are not merely phenomena in the

consciousness (Latour et al., 2011) they act, they do things, they can construct and destroy relations. Actors are not substances (as intended in Aristotle), since they do not endure and are not aggregates (Latour et al., 2011), but they can form macro-actors. The existence of macro-actors is possible because they exist as long as some other actor is relating to them.

> *To summarise, macro-actors are micro-actors seated on top of many (leaky) black boxes. They are neither larger, nor more complex than micro-actors; on the contrary, they are of the same size and, as we shall see, they are in fact simpler than micro-actors. We are able, now, to consider how the Leviathan is structured, since we know that we do not need to be impressed by the relative size of the masters or to be frightened by the darkness of the black boxes.(...) To replace the usual divisions (macro/micro; human/animal; social/technical), which we have shown to be unprofitable, we need terms in keeping with the methodological principles stated above. What is an "actor"? Any element which bends space around itself, makes other elements dependent up in itself 'and translates their l will into a language of its own. An actor makes changes in the set of elements and concepts habitually used to describe the social and the natural worlds* (Callon and Latour, 1981, pg. 286)

Actors are events (Harman, 2009a) because everything happens only once, and at one place (Latour, 1988). They are not

> *source of action but the moving target of a vast array of entities swarming toward it* (Latour, 2005, pg. 46).

Actors are intended to make a difference: if they do not make a difference or do not act, they are not actors (Latour, 2005). The idea that from an ontological perspective humans and non-humans are not different derives from Bloor's principle of symmetry (Bloor, 1991), and within ANT, it is further elaborated. In Bloor, the symmetry is epistemological, while in ANT it is ontological. Since ANT is focusing on actors and their relationships, the researcher does not ask the question "what is it?", but rather "how is it happening?" and "how does this emerge?", because the question is posed in this way, the ontology is suspended, it becomes flat due to the principle of generalised symmetry. The generalised symmetry is reached when humans and non-humans actors are positioned at the same semiotic level and no distinction between different sources of knowledge or social and technical

dimension is made (Akrich, 1992).
There is no pre-order

> *neither is there harmony, composition, integration, or system. How something holds together is determined on the field of battle* (Latour, 1988)

In this generalised symmetry principle, all the actors are concurring to make their relations and their position in the network stronger. Everything is at a stake, so they are working on making the network stronger. Actors become strong when allies recognise them as real and adjust their trajectories to adapt to them (Latour et al., 2011). The rule to follow is to not change the register between the different description, as technical and social aspects have to be treated and described in the same way (Callon, 1986). There is not an universal vocabulary or a way to describe the actors, their network construction and maintenance, but each researcher has to choose his own way of describing because it is not possible to delineate an universal method of description (Callon, 1986):

> *having opted in this text for a vocabulary of translation we know that our narrative is no more, but no less valid, than any other* (Callon, 1986, pg. 4).

Since networks are fragile, this leads to conclude that everything is in a state of continuum eventuality of perishing:

> *the interpretation of the real cannot be distinguished from the real itself* (Latour, 1988) and (Harman, 2009a, pg. 27),

meaning that interpretations are constructed by alliances and networks. There are no actors that are ontologically more important than others, but there are actors that are stronger than the others (Latour et al., 2011). There is no universal truth, but the interpretations are built within the network. Essence is momentary, temporal and local. Actors, when they aggregate and became unproblematic, are forming black boxes, which are considered to be the substance in this theory. A black box is

> *a machination, a stratagem, a kind of cunning, where borrowed forces keep one another in check so that none can fly apart from the group* (Latour, 1987, pg. 129),

that should be well designed to be very difficult to change. When a structure is black boxed, the actors and the alliances appear strong (Latour, 1987). The

black boxes become obligatory passage points for increasing the strength of claim: the cost of debating a claim spreads proportionally with the number of the assembled black boxes (Latour, 1987). Moreover, black boxes are not said to last in time, since they are events that happen in relations, which can shift and be broken. A black box is low maintenance (Harman, 2009a), something actors rely on, taken as given, and the process as how it comes into being is not therefore investigated. There is no opposition between substance and conglomerates of the parts. They can last if they can be considered as trajectories, or vectors (Harman, 2009a) across time and a series of minute transformations. Black box is what needs to be opened up in order to challenge the decisions:

> *the impossible task of opening the black box is made feasible (if not easy) by moving in time and space until one finds the controversial topic on which scientists and engineers are busy at work. This is the first decision we have to make: our entry into science and technology will be through the back door of science in the making, not through the more glorious entrance of ready made science* (Latour, 1987, pg. 4).

The danger that black boxes encounters is twofold: they can receive either too little or too much attention, running the risk of being either ignored (thereby, failing to become obligatory passage points) or to get too much interest as in the form of skepticism or scrutiny (forcing the actors to open them up). Black boxes can be taken and made a freeze frame of it.
Alignment, enrolment, and negotiation of interests are what actors are working towards, in order to avoid the falling apart of the network:

> *every time an ally is abandoned, replacement need to be recruited, every time a sturdy link disrupt an alliance that would be useful, new elements should be brought in to break it apart and make use of the dismantled elements* (Latour, 1987, pg. 125).

Alliances are what really matters and allies work to make the networks and their relations stronger or weaker than the one already existing (Latour, 1987, 1988). All the actors participate in this network construction:

> *the world is a series of negotiations between a motley armada of forces, human among them, and such a world cannot be divided cleanly between two pre-existent poles called nature and society* (Harman, 2009a, pg. 13).

These negotiations are brought into being and analysed according to the dynamics of power and the mobilisation of forces:

> *the one able to muster on the spot the largest number of well aligned and faithful allies. This definition of victory is common to war, politics, law, and, I shall now show, to science and technology* (Latour, 1990, pg. 5).

As consequence of successfully bringing actors together, there is a process of translation. Translations are transformations, undecided controversies, and mechanisms of actions,

> *by which the social and natural worlds progressively take form. The result is a situation in which certain entities control others. Understanding what sociologists generally call power relationships means describing the way in which actors are defined, associated and simultaneously obliged to remain faithful to their alliances. The repertoire of translation is not only designed to give a symmetrical and tolerant description of a complex process which constantly mixes together a variety of social and natural entities. It also permits an explanation of how a few obtain the right to express and to represent the many silent actors of the social and natural worlds they have mobilised* (Callon, 1986, pg.20).

This quote indicates that the translations are happening because of the irreducible singularity, and their essence is translated without emptying their inner kernel (Latour et al., 2011). The visual link of the translations is provided by inscription devices, that remains invisible until they are challenged. The inscriptions are working to get the created network stabilised, to enrol others so that they participate in the construction of the fact and to steer their behaviour in order to make the actions predictable through translations (Latour, 1987). The translation process leads to the interessment and this

> *indicates that interests are what lie in between actors and their goals, thus creating a tension that will make actors select only what, in their own eyes, helps them reach these goals amongst many possibilities* (Latour, 1987, pg. 108-109).

Goals create interests and interests are elastic, so there is one point where they can break, also because the translation is always a transformation that

induces to a loss of energy and information, since nothing can be fully translated into something else in different spaces and times (Latour, 1987). A particular role in the building of the essence is the role of mediators. A mediator is mobilised by the spokesperson to exploit its peculiar characteristics for transporting goals and information, modifying them if needed, sharing and mediating reality with the actors passing through it:

> *The task for fact-builders is now clearly outlined: there is a set of strategies to enlist and interest the human actors, and second set to enlist and interest the non-human actors as to hold the first* (Latour, 1987, pg. 132).

It is possible to look at the enrolment in two different ways: the first one is to look at who has designed to enrol (sociogram); the second by examining what it has tied to what/ whom to make the enrolment inescapable (technogram). Once the frozen frame starts to move, the black box changes what it is made of and whom it is convincing (Latour, 1987). The modification of the system of alliances is made visible and what it is altered in the technogram is made to overwhelm a limitation in the sociogram, and vice versa. The important thing in this process is to understand which associations are stronger and which are weaker, the similarity of the essence of human and non-human actors (Latour, 1987), and the role of mediators, who are actors that are linking other actors, conveying and translating information, whose role derives from the work done in the network of building them. Substance as a way of being is excluded from the sensitive experience, and the substance is made of black boxes and immutable.
In the next section, these concepts are used to understand management of design through the lenses of ANT, believing that, differently from the previous perspectives, the reality and the design that is expressed are intended as immanent and not transcendent: there is nothing hidden behind the surface of alliances and relations (Latour, 1988).

3.2 Understanding design using ANT as framework

This section is meant to be a reflection on what is management of design using ANT as a framework. The writing is a translation in the field of design of papers written in the field of innovation, accounting, sociological journals and reflections that I had with my supervisors and with Professor Woolgar.

This is a framework written during the data collection, so connecting the empirical experience to the review of the ANT work conducted in the previous section. This framework is used for writing up the analysis (Chapter 5) and to mobilise the discussion with the previous perspectives (Chapter 6). The articulation of this section reflects the way in which literature review on management of design has been analysed in Chapter 2.

3.2.1 Design definition

The word **design** is defined as the outcome of the process of constructing things by translating interests and goals, enrolling and mobilising actors. Within this definition, design is an actor: the design behaves in such a way that induces other actors to follow it and associate with, through the interessment process activated by the spokesperson. Design is an outcome emerging from a design process. Design is a technical artefact in which the designers and other actors belonging to the socio-technical network are inscribing characteristics, values and behaviours (Akrich et al., 2002b).
The design products are considered immutable mobiles, as they are immutable until another actor is modifying them, and they are presentable and readable because of their function (Latour, 1990); therefore, they can be used by many of the actors without opposing fierce resistance, also when they travel in space and time. Due to the believe that reality is existing in the relations, design is not as a discovery momentum or an act of genius by a designer. If intended in this way, it is too limiting, because it eliminates all the work done by the actors in the socio-technical networks to design. It also undermines the process of enrolling other actors, including instruments, analysing, prototyping, interpreting the inscriptions, the time and the efforts spent observing how the actors are interacting with the design and the trials with the machines and the materials (Latour, 1987). Design should be intended as construction of design: constructed and socialised, made coherent inside different networks, after having been developed in a equipped studio or prototyping space, forged as history of its construction and its transformation. Design is constantly in search of allies and the designer and the manufacturer are the actors who are acting to capture the allies' attention, displacing goals and enrolling other actors in the network, making constant reinterpretations explanation after explanation, and reinterpretation of the features of the design.

3.2.2 Design Process

The design process is directed to the creation of the reality (the design), it is the process through which the design gains strength only by associating with others (Latour, 1988). During the process, the spokesperson emerges. The spokesperson is an actor who is speaking on behalf of the allies, and they recognise him/her as their representative in the network, trying to create a stable network of human and non-human actors that become allies across social, organisational, and technical domains. Studying the reality construction, mobilisations, interessement process and translations could lead to a better understanding on how the design process happens and how the actors are supporting and stabilising the design product during its development and life cycle.
Design process happens through **translation**, which is a process aimed at influencing relationships between the human and non-human actors to enrol and interess other actors to be in the network and to make it stable by solving struggles. **Interessement** is the process of successfully getting others to support, interact, and devote their energy and resources toward something:

> *the model of interessement sets out all of the actors who seize the object or turn away from it and it highlights the points of articulation between the object and the more or less organised interests which it gives rise to* (Akrich et al., 2002b, pg. 205).

Throughout the analysis of the interessement process, it is possible to understand the mechanisms that made not only a product designed and produced, but also its path (successful/failure). As affirmed by Akrich et al. (2002a) the design is perpetually in search of allies supporting the network. Actors in ANT are semiotic entities constituting reality, they are acting in a space, assembling, and constantly creating society. They are concrete and real entities, with a defined full set of features, forming a substratum of relations, alliances, and peripheral accidents. This way of analysing a design can increase the knowledge of management of design. Actors become real when they are embedded by peripheral accidents and relations, making visible the identification of the possible features that belong to the actor itself only in this relational process, making the essence of the product understandable.
The nature of design is the outcome of a constructed network of humans and non-humans actors allying to each others. The design process is about co-constructing design in a context that is not planned, sketched or anticipated, and also framing it, emerging from the capability of entering into a dialogue with multiple actors and enrolling them in the network, and from the capab-

ility to exercise power in front of forces that resist change. Each modification of the interests, each translation, each interaction in one system of alliances is visible and it modifies the other systems: during the process, the social and the technical are always inevitably tidied together. The design process is also about working on the goals between the human and non-human actors, and the spokesperson is working to enrol and interess other actors and inciting to do the same to stabilise the network, making it less fragile. Design processes and new product development can be seen as a mishmash of decisions that cannot wait in an environment of complex changing markets and customer tastes, in which actions cannot be planned or predicted in any mechanical way (Akrich et al., 2002a). In the process, the products face many different trials (tests) and accusations, and in these, there are claims for a design, and its features when the new design is better than prior solutions (Akrich et al., 2002b). Therefore, the design process is an interessement process, because it is about successfully getting others to support, interact, and devote their energy and resources towards something (Akrich et al., 2002a). The outcome, the design object is not only a reflection of the technical features of the product, but also the result of numerous agencies constructions, and of the fact that a product has been able to be displaced across time and space as the result of a intricate variety of actors and situations springing from their relations. In the process, an endless number of actors are needed

> *to enrol others so that they participate in the construction of the fact; to control their behaviour in order to make their actions predictable* (Latour, 1987, pg. 108)

The meaning and the qualities of the objects are produced, not given, as objects do not have inner properties; the semiotic meaning of design is not *a priori* determined, but constructed in the network by engaging a multitude of the complex micro-processes that happen in the design creation, development, launch, and post launch moment. The success of a design is decreed by the process of interessing, mobilising, and enrolling allies in the network, but also of moving across the fluid boundaries to make the network bigger and more stable.

Expanding the view on what design is about Since design can travel in space and time, it is interesting to look at the displacement after the introduction in the market. The design is displaced, moving in space and turning out to be durable with time because of the actions of the other actors relating to it, such as spokespersons clearly associating or disassociating features, or devices mobilising interests. If this process stops, then the product falls

apart. In the previous perspectives, the diffusion model (Rogers, 1995) has been used to explain the acceptance of the design, but it does not explain the success of a product, because in the diffusion theory no one is

> *necessary anymore to shape the black box. There exist only customers who buy it* (Latour, 1987, pg. 137).

Instead, in ANT, the consumer is not as simplified or passive as depicted in the previous literature, but he/she is in charge of the faith of the product. He/she is an actor that is allowing the product to be alive. The purchase process does not happen passively, but is an active process: the customer is framed, mobilised by the company and the framing devices. Design is performative through the relations (Latour, 1999). Latour (1991) explains that the success of an innovation is not only due to the fact that a technology is simpler or better than another one, but rather to the fact that the customers could understand and accept a long chain of translations embedded in the product and black box them. There are some actors that are black boxed through a long chain of interests and translations, and the product is made successful as long as the relations are stable and strong. This would suggest that longer and stronger the translations are, the likelihood of the product to be accepted and to become and remain successful is higher. The customers are not able not see the long chain of translations that is happening from the idea generation to the launch, and they need to be framed in the purchase of the product. The interests and the framing process are elastic and they can break in any moment if not supported; when the negotiations become tense and difficult, they can break down and the sales can decrease. The design is an outcome of how reality is produced during the whole PLC, it is the effect of the network construction, as discussed in Latour and Woolgar (1979)

> *by observing artefact construction, we showed that reality was the consequence of the settlement of a dispute rather than the cause (...). If facts are constructed through operations designed to effect the dropping of modalities which qualify a given statement, and more importantly, if reality is the consequence rather than the cause of this construction, this means that a scientist's activity is directed, not toward reality, but toward there operations on the statement* (Latour and Woolgar, 1979, pg. 236-237).

3.2.3 Role of designer

The designer is one among the many actors who are working to construct the design. He is also one among multiple actors inscribing meaning in the

design. A designer is an actor that not only can engage himself actively for framing the object, but also can act as a mediator. If the role of mediator is successful, he can become a macro-actor (the term is analysed in more detail in the Section 3.3, pg.146). ANT is a philosophy that is analysing how actors are interacting at the local level without appealing to any super-entity more powerful than other actors. However, the paper by Callon and Latour (1981) recognises the possibility of the existence of a macro-actor. A micro-actor becomes a macro-actor when he/she obtains a contract that is the translation of all the negotiations, intrigues, calculations, acts of persuasion (Callon and Latour, 1981, pg. 279). In ANT, actors are isomorphic, that is, all the actors have ontologically the same size and what they are it is a consequence of a long struggle (Callon and Latour, 1981, pg. 280). However, in the paper it is alluded to the possibility of having actors that are macro-actors because they ally themselves with the black boxes and other actors, altering their size. Because of the capability of designers of networking, explained in the previous chapter, the designer can be considered a macro-actor able to move the design process because of this aggregation of actors supporting him/her, and he/she is able to bend the space around by firmly associating with a large number of allies (Callon and Latour, 1981), and making the difference when he/she can dissociate as speedily as possible elements enrolled in the network (Callon and Latour, 1981).

3.2.4 Role of management

Managers are actors that make decisions that cannot wait (Akrich et al., 2002a), and, if successful, can become spokespersons (Akrich et al., 2002b). For a more detailed analysis of the spokesperson, see next section, the role of the spokesperson at pg.146, Section 3.3

3.2.5 Value Creation Process

As discussed in the previous paragraph, qualities and features are important to the analysis for determining the essence of the object. They are made in the relations, therefore they are the outcome of a dynamic process of qualifying (Christiansen et al, 2010). Latour (1999) affirms that an object has not only relations, but also features, and an actor is not different from its features. The qualities/features might be understood as accidental because they are framed and built in the relationships. By the process of framing, the meaning is constructed in the relationships of the object with the users, and mediated by other actors that are present in the network and that helps to

construct it. Value is generated from this process, it resides in the relations, it is understood as emergent, fragile, and in the need of a spokesperson responsible for the process of associating and disassociating features.

3.2.6 Role of technologies of managing

The technologies of managing are non-human actors that are present in the network as to increase the strength of the ties and to convey information (Czarniawska and Mouritsen, 2009, Mouritsen et al., 2001b).
These are not simple intermediaries because the input and the output are not the same, they are not simply conveying information, but they are also influencing the output, assigning accountability, reducing uncertainty by comparing different alternatives of calculation (Mouritsen et al., 2001a), they are managing tools, since

> *managers use some objects to manage others, and they use them to separate themselves from the objects to be managed* (Czarniawska and Mouritsen, 2009, pg. 159)

and reframed to be grasped in their use. This is aligned with the argument sustained by Miller and Rose (1990): the mediators have the characteristic of an instance of power (Law, 1992, Miller, 2001) because they reveal the mechanisms through which the government is articulated and made operable. It is a social practice constituted by relations because it is influenced by the multiplicity of agents, institutions and processes (Miller and Rose, 1990). According to Cooper (1992), managers use the technology to have control and take decisions, and to represent related information. The way information is produced and managed is through displacement, that is the act of moving things, changing relations between different actors and then acting and intervening on the part of the world (Cooper, 1992). An artificial situation is thus created, where the real world is transformed into an artificial one to be made more manageable, clear, visible and transparent, with

> *the aim is to make the organisation seeable* (Cooper, 1992, pg. 263)

and controllable. This is intended remote control,

> *which reduces what is distant and resistant to what is near, clear and controllable; at the same time, the significance of representation through remote control is that it takes precedence over the event it represents* (Cooper, 1992, pg. 263).

Information becomes manageable:

> *information is no longer commodity or surprise. Representation shows it to consist of a spatial and temporal fold where an inside of familiar and manageable forms is constructed, re-presented, from an outside of resistant and retroactive forces* (Cooper, 1992, pg. 271).

Knowledge about phenomena, objects and technologies is created through inscriptions; inscriptions are transported to a centre of control where managers can act upon them at a distance, fostering the decision-making process, and becoming mediators in the processes of strategising and organising, because the complexity of degree of management is reduced. By separating these elements, control is emphasised through simplification (Czarniawska and Mouritsen, 2009) but simplification through translations might distort the observations (Hansen and Mouritsen, 1999). When managerial technologies are activated, action at a distance is enabled, allowing a perspective on the firm and the issue of interest.

3.3 Framework for the analysis

The aim of the analysis is to understand for each design (total of designs: three; the Serie7, Egg, Ice):

1. Who are the actors in the networks?

2. What translations, mobilisation, enrolment, spokespersons can be identified?

3. Which are the features of the products that are associated and disassociated?

The aim is to understand the managerial implications (what does management mean if design is considered a network effect), the implications for theory (learning from ANT versus using other perspectives), what is the role of technologies of managing in the process, and which technologies are mobilised and which are used to manage design.
The analytical framework is ri-elaborated from the following quotes from Latour (1994)

> *In the newly emerging paradigm, we substitute collective-defined as an exchange of human and nonhuman properties inside a corporate body- for the tainted word society. In abandoning dualism, our intent is not to abandon the very distinct features of the various parts within the collective. What the new paradigm attends to are the moves by which any given collective extends its social fabric to other entities. First, there is translation, the means by which we inscribe in a different matter features of our social order; next, the crossover, which consists in the exchange of properties among nonhumans; third, the enrolment, by which a nonhuman is seduced, manipulated, or induced into the collective; fourth, the mobilisation of nonhumans inside the collective, which adds fresh unexpected resources, resulting in strange new hybrids; and, internally, displacement, the direction the collective takes once its shape, extent, and composition have been altered* (Latour, 1994, pg. 46).

The analytical framework is therefore constituted by the following elements:

- Allies: they are forming the network in which the design is mobilised, the design process and the displacement happen.

- Translation: the drift; the link between actors; what makes an actor what it is; how it emerges; and how it comes into existence.

- Enrolment: the processes, arguments that made the actors being part of the network and support the design.

- Mobilisation: a series of actions that start with an interest and that is generally considered to be consequential and then translates the actors to adhere to the programme of action.

- Macro-actors: the representatives of a sub-network, but they are not acting as spokespersons of the design and its process.

- Spokesperson: the person who is mobilising goals; speaking on behalf of the design; stating a programme of action.

- Features associated and disassociated: to understand the process of value creation, the features that the spokespersons is supporting and the one that are left out.

From the paradigm proposed by Latour, the displacement and the crossover are taken-out. The displacement because it is already explained through translation, since the translation process

> *emphasises the continuity of the displacements and transformations which occur in this story: displacements of goals and interests, and also, displacements of devices, human beings, larvae and inscriptions. Displacements occurred at every stage. Some play a more strategic role than others* (Callon, 1986, pg.19);

crossover has been taken out because it is not useful for answering to the research question.

Allies (both humans and non-humans) are associating because they are translating the aims and goals in something they recognise and accept. Actors have the same ontological dignity, there is perfect symmetry between humans and non-humans, they can be elaborated on (unraveled) as themselves are comprising a network, or they can be black-boxed. Actors become stronger to the extent that they can firmly associate with other enrolled elements (Callon and Latour, 1981).

Particular categories of actors are **intermediaries** and **mediators**. Intermediaries give form and consistency to the heterogeneous relations in the network. They have well-established (and thus well-known) input and output (if the input is defined, it is enough to understand the output). They may be constituted as giving instructions to actors in the network about what can be expected, what is inside the domain of the network, and they reflect relations between human actors within the network. For all practical purposes, an intermediary can be taken as a single black box counting for one, even if it is internally made of many parts (Latour, 1987). Mediators, instead, convey information in the network, and they cannot be counted as a single black-box (Latour, 1987). Contrary to intermediaries, their input is not a good predictor of their output; therefore, they need to be analysed in detail through their associations. Mediators transform and translate the meaning they are supposed to carry, originating new translation, making the movement of and in the social visible to the researcher (Latour, 2005). The main difference between intermediary and mediator is not whether they have an identity, but rather if they act and thus have agency (Czarniawska and Mouritsen, 2009).

In the analysis, the black boxes (both black and leaky) are considered intermediaries, while the allies are mediators.

In the network formation, the allies take decisions, and these decisions contribute to setting up other allies or making them adversaries or sceptics

(Akrich et al., 2002a, pg.205). The outcome of the decisions

> *depends on the alliances which it lows for and the interests which it mobilises* (Akrich et al., 2002a, pg. 205)

A distinction between **spokesperson** and **macro-actors** is necessary. In the writing of Callon, Latour and Law, the terms macro-actors, spokesman and spokespersons seems to be sometimes used with different meanings, other times it seems they are synonymous. The term macro-actor is described in Callon and Latour (1981).
The concept of **macro-actor** is not meant in evolutionary but in dynamic terms, in the sense that, being the actors isomorphic, a macro-actor is an actor which identifies and represents a network of actors, growing to a macro-size. In Callon and Latour (1981) the following question is asked:

> *How does micro- actors grow to such a formidable size like that of big multinational corporations?* (Callon and Latour, 1981, pg.277).

Therefore a macro-actor represents a collective action, but he/she is not necessarily a spokesperson. However, probably because the concept of spokesperson was not yet developed, the term in Callon and Latour (1981) was used interchangeably as spokesperson. For the purpose of defining the macro-actors, the paper of Callon and Latour (1981) is read isolating the two terms (macro-actors/spokesmen) and the explanations related to them to distinguish the two term. Both the terms are based on this statement:

> *All differences in level, size and scope are the result of a battle or a negotiation. We cannot distinguish between macro-actors (institutions, organisations, social classes, parties, states) and micro-actors (individuals, groups, families) on the basis of their dimensions, since they are all, we might say, the same size or rather since size is what is primarily at stakes in their struggles it is also, therefore, their most important result* (Callon and Latour, 1981, pg. 279).

Through the translation, the macro-actor takes force and authority and represents the other actors.
The spokesperson is defined an actor who is able to translate, speak, or act on behalf of another forces or actors, because he has persuaded the other actors to do so after chain of negotiations, intrigues, and calculations (Akrich et al., 2002b). In Callon et al. (1986), the spokesman is defined as a translator

representing the entities he constitutes. However, the spokesperson can be unsuccessful if he/she has problems in the translations

> *Translation becomes treason, tradutore- traitor, once an enrolled entity refuses to enter the actor- world in order to expand into others. Since entities are not easily translated, the destiny of most spokesmen s thus to be brutally contradicted* (Callon et al., 1986, pg. 25).

He becomes stronger when he can talk for and represent the actors mobilised and enrolled in his/her programme of action.

> *The translator expresses their desires, their select thoughts, their interests, their mechanisms of operation. This is the most general way of expressing it, for what is true for human entities, whether they be collective or individual, is also true for other elements that constitute an actor-world* (Callon et al., 1986, pg. 25)

The spokesperson can be of two typologies: objective or subjective, depending on the trials of strengths. An objective spokesperson' s links resist despite the efforts of disbelievers, while a subjective spokesperson is not speaking in name of other people, but he/she is representing only him/herself (Akrich et al., 2002b). A successful spokesperson is objective, and he/she speaks on behalf of others, because he/she is entitled to make actions and make decisions that will be crucial for the faith of the product (Akrich et al., 2002a, pg. 194). This is why a spokesperson is more powerful of a macro-actor, or at least in the interpretation given in this dissertation.

In the literature the spokespersons/spokesmen are usually managers of the company, team leaders or project managers (Akrich et al., 2002a,b, Callon et al., 1986, Christiansen and Varnes, 2008, Latour, 1983, 1987, 1988, Latour and Porter, 1996, Latour and Woolgar, 1979). If the managers are spokespersons, and he design process is considered a collective action (Akrich, 1992, 1993, Akrich et al., 2002a,b) what is the designer? The designer, in this thesis, is defined as a macro-actor, a person representing all the actors involved in the design process.

Translation is the mess by which the actors inscribe in a different matter features proper of other actors (Latour, 1994, pg. 46), and characterises changes in network-relations (that is relations between and among network elements) that modify relations among the actors, possibly activate new actors, and change the technology or artefact that is bound up in the network. Translation has a double connotation: to translate and to displace. Hereby,

the notion of translation sensitises to what remains in place, and what gets lost (or changed), as a result of the translation. A translation may also be resisted (some elements may not be easily enrolled into a network of relation), so translation is a product (result or effect) as well as a process. Translations are made by each actor who sees a margin of negotiation to transform the meaning to fit and to adapt it to local circumstances (Latour, 1987).

> *Translation builds an actor-world from entities. It attaches characteristics to them and establishes more or less stable relationships between them. Translation is a definition of roles, and the delineation of a scenario. It speaks for others but in its own language. It is an initial definition* (Callon, 1986a, pg. 24-25)

The translation, if successful, leads to the mobilisation and enrolment of actors.

Mobilisation characterises the ordering of the various network elements, which gives the network its strength and durability. When actors are mobilised, it is not all network elements which are "active", but they all contribute to the network's durability, because of the mutual relations they enter into (are 'fixed' into) through their mutual simplification and juxtaposition (Latour, 1987).

Enrolment is the process of getting the control of actors to participate at the construction of facts and make their actions predictable (Latour, 1987, pg.108).

If these processes are successfully accomplished, than the network is stabilised and there is support for the actors in the process. Because these concepts are connected, in the analysis they are described in the same paragraph (translations, mobilisations, enrolment).

For understanding the **associated and disassociated features** from the network through the work of the spokesperson, a figure is drawn in the analysis. The drawing is inspired by the claim that the difference in the network are ascribed to the experience between those who resist and those who do no resist, and the spokesperson actively work against the actors who are destabilising the network, by creating arguments, supporting features, and working against the features that are destabilising the network.

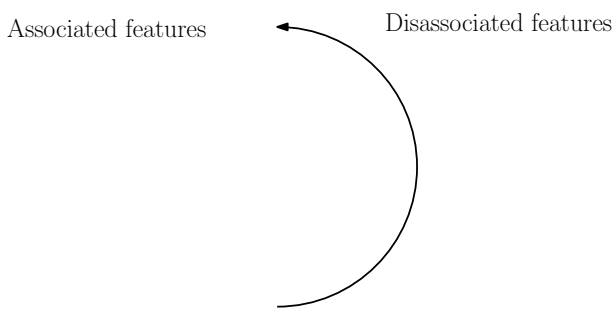

Figure 3.1. Model for the analysis of the features associated and disassociated.

This model is based on one proposed by an earlier study (Callon, 1986, pg. 21) and re-interpreted in another (Hansen and Mouritsen, 1999, pg. 458). In Callon (1986), the Figure 3.2 seems to mean that there is a system of alliances, or associations, between entities that are defining the identity and what they want, force that are acting to define what is in and what is out of the network. This interpretation is not sure, since there are no explanations or captions in the paper about this figure.

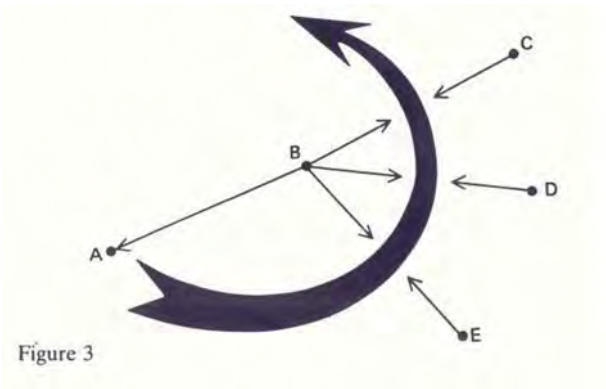

Figure 3.2. Figure 3 in Callon (1986, pg. 21). In the paper it is unclear what the figure represents, and which forces (presumably) are, what they are representing.

In the study by Hansen and Mouritsen (1999), the figure is interpreted as an enrolment process. The arrow shows the force, what draw an actor toward a goal rather than another one through the interessement device:

> *Figure 2 illustrates how management enrolled the development engineers towards invoking rather than towards high performance. Management thus reorganised the cost test in time and produced the conditions for invoicing* (Hansen and Mouritsen, 1999, pg. 458)

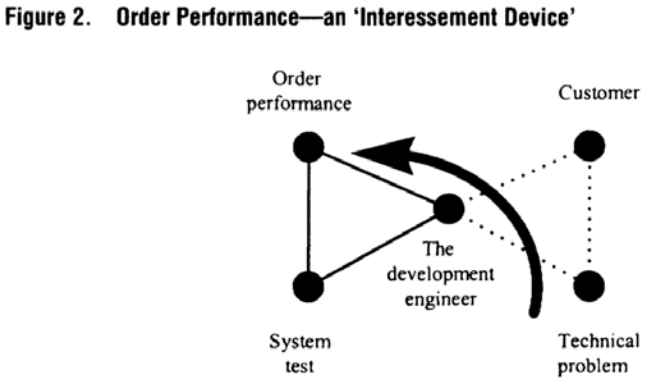

Figure 3.3. Figure 2 in Hansen and Mouritsen (1999). The figure represents the interessement devices as forces that are helping managers to take decisions.

The arrow in the figure for the analysis represents the work carried out by the spokespersons to support some features and to cut off others from the network; these are representing the framing process, where framing is defined as

> *an operation used to define individual agents, which are clearly distinct and dissociated from one another. It also allows for the definition of objects, goods and merchandise which are perfectly identifiable and can be separated not only from other goods, but also from the actors involved, for example in their conception, production, circulation or use. It is owing to this framing that the market can exist, that is to say, that distinct agents and distinct goods can be brought into play since all these entities are independent, unrelated and unattached to one another* (Callon, 1998, pg.17).

The arrow represents the mechanisms, the forces that are including and excluding features that otherwise would not be associated or disassociated from the actor analysed. Therefore, the arrow is a process of framing the inclusion and the exclusion.

3.4 Conclusion- An emerging perspective: understanding design with ANT

The research question is how can management of design be understood through the lenses of ANT. To answer to this question, ANT is used for creating the analytical framework. The chapter was divided in two sections:

in the first, the concepts of what ANT is, and the philosophical negotiation (discussion on the metaphysics, essence, ontology and substance) are presented. In the second part, the understanding of the management of design is analysed. ANT considers reality as relative and co-constructed, existing only within the network and in the translations. For this reason, it has been indicated also as sociology of translations (Callon, 1986). Translation is a displacement, a drift, a mediation, a creation of a link that modifies the actors (Latour, 1994). Since reality exists in the relations, the study of translations becomes the focus of the management of design, and it is possible because of the irreducibility of actors. Through the study of translations, a researcher can understand what an actor is, how it emerges and its mode of existence. The translations are trajectories when the spokesperson is actively transforming across the network. Agencies are shared in the networks, and an actor is what it is because it modifies the features through the relationships. Actors are not fixed entities, but they are semiotic entities (Latour, 1987) and performative (Latour, 1999). They get together through the enrolment process, during which they agree to listen to the spokesperson and adhere to their programme of action.
These concepts are used in the analysis, to identify the actors and their alliances in the networkss in the different episodes, the translations, the enrolment, the mobilisation, the spokesperson and the features associated and disassociated.

4
Method

4.1 Introduction

This chapter is about the designing of the appropriate methods for collecting data, and about the design of the dissertation that is an inscription of meanings deriving from interpreting the data. As researcher, I consider myself a mediator because I initiated the process of inscription of an heterogeneous number of allies that mobilised, carried and transported information (Czarniawska and Mouritsen, 2009). Therefore, this dissertation is the outcome of a process of negotiation and interactions, data analysis, researches presentations and seminars, long discussions with my supervisors, and confrontation with my colleagues. Due to the multiplicity of reality, this dissertation could be otherwise (Woolgar, 2013): it is the the elaboration of one of the possible features, one of the possible realities that have been mobilised. According to Latour,

> *the ANT scholar has to trudge like an ant, carrying the heavy gear in order to generate even the tiniest connection* (Latour, 2005, pg. 25).

To design the thesis, some reflections were made. Firstly, the research positioning and philosophy (Chapter 3) were defined; secondly, the quantitative methods were excluded, because of the stated problem: *how does a product emerge if it considered and understood as a network effect*, which requires a descriptive method; thirdly, the definition of method proposed by Law (2004) was followed:

> *method, in the reincarnation that I am proposing, will often be slow and uncertain. A risky and troubling process, it will take*

> *time and effort to make realities and hold them stray for a moment against the background of flux and indeterminacy* (Law, 2004, pg. 10).

Accepting this interpretation of method, than

> *It takes longer to do things. It takes longer to understand, to make sense of things. It dissolves the idea, the hope, the belief, that we can see to the horizon, that we can see long distances. It erodes the idea that by taking in the distance at a glade we can get an overview of a single reality. So the stop has its costs. We will learn less about certain kinds of things. But we will learn a lot more about a far wider range of realities. And we will, or so I also argue, participate in the making of those realities* (Law, 2004, pg. 10).

Thus, the method is not just a method or a set of techniques (Law, 2004), but it is one actor to use among multiple realities, without pretending to look for absolute certainty, stable conclusions and universal truth. The method considered suitable for an analysis aimed at looking at the micro processes happening in the design process, the traces left by the actors and the features and qualities attached to the chairs is an ethnographic approach that is a mishmash between ethnography, historical ethnography, visual ethnography, and ethnomethodology. As expressed in Latour and Woolgar (1979) the reason for carrying an ethnography is about the researcher following the intimate processes, but remaining at the same time an "insider" outside the organisation (Latour and Woolgar, 1979, pg. 12).

4.2 Ethnographic method

The aim of the ethnographic method used in this dissertation is to follow the actors in their process of network construction, their trials to make the ties stronger; to see how they have compromised, negotiated, schemed, combined, and compacted their associations; how translations happened and what was actually translated. Following the actors in their different networks was needed to document how they mobilised, juxtaposed, and held together, leading the researcher into an in-depth and scrupulous three-year journey. Actually, this study started as case study (Yin, 2009), but it became an ethnographic study because it was clear to me that this method allowed a more in-depth understanding of the organisation, still keeping a critical distance, without a precise set of rules to follow (Law, 2004).

> *I call ethnography a meditative vehicle because we come to it neither as to a map of knowledge nor as a guide to action, nor even for entertainment. We come to it as the start of a different kind of journey* (Tyler, 1986, pg.140).

Ethnomethodology is a stream of ethnography that focuses on the way actors construct their social world and the reality they live in. The reality that is studied is not objective, but the way participants create a sense of reality and of the social structure is what is interesting to study. Latour (2005) sustains that ANT is ethnomethodology. ANT is looking at the network construction and the meanings in the network. It is reflexive and is concerned with the ways translation and enrolment occur; this is inherited from STS:

> *the central object of ethomethodological inquiry hinges on a paradox... despite the fact that documents are indexical [subject to changes of meaning with their occasions of use], that any attempt to specify their underlying meaning is in principle both defeasible [constantly subject to proposed alternatives] and inconcludeable[endlessly endless], and that they bear a reflexive [circular] relation to proposed underlying realities, members routinely establish connections between documents and underlying patterns, and their establishment of these connections between documents and underlying realities, members do routinely establish connections between documents and underlying patterns, and their establishment of these connections is routinely taken to be both adequate (for practical purposes at hand) and unproblematic. Ethnomethodology is concerned with the ways in which this occurs* (Ashmore, 1989, pg. 49))[1]

Compared to other traditional ethnographic studies, this dissertation focuses not only on the study of human actors but also of non-human actors. The aim is not

> *drawing up all the rules and regularities of tribal life; all that is permanent and fixed; of giving an anatomy of their culture, of depicting the constitution of their society* (Malinowski, 1922, pg.11),

rather to follow the actors and understanding what constituted their reality and their relationships (Latour and Woolgar, 1979), as already done in other

[1]Ashmore quoted Woolgar, 1988. Reflexivity is the ethnographer of the text

STS (Science and Technology Studies) and ANT researches (for example, the one carried out by Grint and Woolgar (1997), Latour (1988), Latour and Hermant (2010), Latour and Woolgar (1979)). Due to the principle of symmetry between humans and non-humans, it has been demonstrated that the application of the ethnographic method and the reality's enactment do not change compared to the human ethnographies. In order to build the history of the chairs, a historical ethnography was conducted. To reassemble the history of the chairs and their network construction, the following quote was used as guideline:

> *Historians share with sociologists a belief in the existence of a context in which the events have to be carefully situated. For sociologists this context is made up of the social forces that explain the events the catch phrases including "it is not coincidence that" or "it fits in well with the interests of"; for historian the context is a set of events firm tied to the chronological framework. For both trades there exists a context and it is retrievable, at least in principle. Despite their feud, the two disciplines believe in the difference between context and content. Once this belief is shared, people can disagree, some preferring to stick to the content (they are called internalises), others to the context (they are called externalists) and still others to a careful balance between the two. For the two disciplines, additional soaves will make the series converge into one overall more or less coherent picture. This is the basic assumption that is not shared by semioticians, or for that matter by ethnomethodologists. More data, more sources will make the sources diverge more and more. To be sure, it might be possible to obtain some effects of totality, but these exceptions, local productions inserted among the others and dependent upon a local panopticon* (Latour, 1988, pg. 253).

The three chairs that are object of the analysis (Serie7, Egg, Ice) are produced by Fritz Hansen, Danish design company, whose official business strategy, in these three years I have been in the organisation, is twofold: to exploit the value created by the classic items, and to rejuvenate the brand by launching every year a new product in the market (at *Fuori Salone* design fair in Milano) with the hope it will become the new classic product in a near future. From one of the last meetings, however, the management expressed the doubts in actually being able to master this exploitation/exploration strategy, and they might use the results of this thesis for interesting the top management about this problem. The design philosophy currently ad-

opted by the company consists of design ambitions and core values, which are used as guidelines for developing new products: the design philosophy continuously seeks the obvious visual (original pure, long lasting), emotional (genuine, serene, Danish), rational (superior, quality refined, ageing with beauty) values.

4.3 Getting access in the field

In the ethnographic studies, getting access to the field is one of the most crucial moments in the research process (Davies, 1999, Hammersley, 2007, Tyler, 1986, Van Maanen, 1995). When I started my PhD, the field was somehow given. The PhD proposal was concerning issues related to design. I have been knowing my supervisors for more than one year, since I was hired by them as assistant for writing an article for a conference in 2009, which became a published article in 2010 (Christiansen et al., 2010). That was a study on the value creation in design, using Fritz Hansen as case. In the article, it is explained that a product and its life are usually expected to follow the rules of the product life cycle (PLC), wherein products are expected to move from an investment toward a profitable mature peak that ends when the product is phased out. This study illustrates the sales volume of Arne Jacobsen' s Egg chair over a 50-year period, shifting from low to high volume and from extremely low to high again. The article was written with the purpose of introducing a theoretical perspective in which value creation is described as a process of valuing, based on a co-constructivistic view of value creation. In 2011, we presented the published version of paper to the top management of the company (CFO, marketing director and sales director), explaining the relationship between value creation and the life of the Egg chair, through different associations, relationships, and conflicts, illustrating the moments in which consumers attached, detached, and reattached to the product through processes of qualifications and re-qualifications. The managers liked the concept of framing devices, which works as management technologies in processes that involve the creation of long-lasting product icons. After a brief discussion in Danish between them and my supervisors, I was asked if I wanted to continue the study on framing devices in my Ph.D also for other chairs, that would be defined in a following meeting. I was enthusiastic, as Fritz Hansen was producing some among my favourite design items.

4.4 Data Collection

The data collection started a month after my enrolment in the PhD programme. In the Appendix B, there is a section dedicated to the field journal, with the summary of the field work. As the information reported in the interviews were sometimes confidential and I was asked to not divulge the content of the interviews, I respect the desire of the interviewees and they are not going to be inserted in the appendix for ethical reasons.
The research questions came up after a while I was in the company and I was working with the material. The questions were the result of a mishmash of interests, the focus of research in the department and the recent trends in the literature of design management. Therefore, I began to compose a general and rudimental idea of the questions I wanted to answer. The research questions did not transpire from the data, but the data became a salient part for understanding the direction of the research: I have refined and sharpened the research questions by staying in the field and interacting with the data. In the second meeting between me, the marketing manager, his assistant, and my main supervisor (which could be indicated as the beginning of the study), it was decided to study Serie7, Ice Chair and PK22. During the process, the PK 22 was substituted by the Egg for lack of data: in 1960s an1970a Poul Kjaerolhm chairs were produced by another manufacturing company, and after the death of the manager the drawings and the Intellectual Property Rights were bought by Fritz Hansen. If I wanted to conduct a project about value and PLC, the product development, the discovery of the framing devices for the periods of picks and lows in the sales, I would have encountered huge difficulties to trace any data. I even contacted the Kjaerolhm' s family to investigate if they had any document concerning sales, or diaries by Poul, statements from him, but they could not help. Due to these problems, we decided to go in-depth with the study of the Egg. During the first stint I was in the company, I realised that one of the most important things to do was to get familiar with the people working in Allerød (the headquarter of the company) as quickly as possible, hoping that this would help to construct an analytic framework, to collect data and relevant information for my research. At the beginning, I used some time (one month) in a quite unstructured manner, just getting into the company, and trying to figure out their culture, the products, the organisation, and how the actors (both humans and non-humans) in this company interacted. I was introduced by the assistant of the marketing manager to some of the other people of Allerød as a PhD student who intended to study the framing devices that made Fritz Hansen' s products a classic. At the beginning, it

seemed to me a very open and informal environment. After a month, I started to realise that the situation was more complicated than expected. Even if the company was very open and willing to collaborate, by organising numerous interviews (in one week I conducted 8 interviews lasting from 1 hour to 2 hours and half), I did not have easy access to the internal documents and internal warehouse. I could not get access to intranet, and I needed to negotiate that. The assistant of the CEO required me to ask her very specific questions, such as what kind of data I was looking for, for what I needed them, or how I intended to use them. For me, this request was frustrating, since I did not know exactly what I was looking for, the use I intended to do, and how they could be used to relate to the research questions. She wanted to know what method I was exactly using, which truth I intended to discover, which single set of processes I was looking at. Moreover, at the beginning of the Ph.D, I did not speak Danish, and that was impairing me from understanding most of the articles or internal documents that the secretary of the CEO was, from time to time, e-mailing me. I felt cut off from any conversations in the canteen, and I felt double foreigner: not part of the organisation and not part of the Danish society. I decided to spend the summer and the first part of autumn to learn Danish and to collect information about the chairs I intended to study. When I felt more comfortable with my knowledge on design and on Danish, I went back to the field study, but the attitude towards me was changed. I heard the design department had some troubles with another PhD student, and I perceived they lost interest in my research. The other PhD student was analysing something that was not meaningful for the managers of Fritz Hansen, and that thesis was perceived as a waste of time. I could feel that my presence was barely tolerated, and my access became very restricted and always supervised. I could not walk freely in many of the area of the organisations, and for exploring, copying, getting any kind of data I had always to ask for the permission of the secretary of the CEO. In October 2011, my supervisor received a mail:

> Opgave- Marta Gasparin
> Kære John,
> Vedhæftet har vi kort opridset, hvordan kommunikations- og mail forløbet har været, siden Marta er startet på sin opgave hos Fritz Hansen, som det tegner sig for os. Jeg foreslår, at vi holder et møde her hos os, således vi kan aftale, hvad Marta mangler for at komme videre med sin opgave. Hvis du ringer til B*** tlf: 25*****, kan I aftale et tidspunkt, der passer os alle.
> Med venlig hilsen

(translated: Attached we briefly outlined how communication and mail process has been, since Marta has started her task by Fritz Hansen, as it accounts for us. I propose that we hold a meeting here with us so we can deal what Marta is missing to get on with her job. If you call B *** tel: 25 *****, you can arrange a time that suits us all.) Sincerely,

My supervisor wrote me this mail:

> Dear Marta,
>
> There are different expectations involved here, but my understanding from what *** said and what is in the document is that they (*** and ***) in some way have lost the feeling of the project, what it is about and what information you are looking for. There also seem to be some misunderstandings where they have expected you to come back and ask for more or something like that. It's always a concern to align expectations and I would try to learn from their reaction, and say that we might need to communicate better and more with them about what is happening and why. It would be great to have the draft of the first phase of the cases to discuss with them and a list with data that are needed. That is according to our plan and what I wrote back to ***.

After this, there was a meeting with the steering committee explaining what is the role of the researcher in the company. We spent a considerable amount of time to regain the trust: I was going there alone every day and once a week with my supervisors to demonstrate that from an academic perspective this project was important and worthy to regain legitimacy. After this intense period, we visited Fritz Hansen regularly and we located ourself in the warehouse to scan documents. We also asked to interview again some people I had already interviewed in June together with my co-supervisor and he conducted the interviews in Danish. During the first period of "going back again in the field", I spent a considerable amount of time understanding the "story of the chairs". I often visited the the Design Museum Library in Copenhagen, asking the librarians for interesting books about Fritz Hansen, the chairs and Arne Jacobsen, and I went also to the Frederiksberg Library and to the National Library. I could find many stories about Arne Jacobsen, but very fragmented that emphasised him as a great designer, and I had hard time to understand what really happened, which were the microprocesses of the product development of the chairs. I was listening to the narratives and the discourses around the chairs. At the same times, I was

still interviewing people. These interviews left me very unsatisfied, because the actors interviewed did not know much about the past history of the firm. At the beginning, I interpreted that as closure towards me; as unwillingness to cooperate. But later, I discovered that the employees did not have any historical memory, they knew only a couple of anecdotes about the design of the chairs, but nothing more specific. When questioned, they all suggested to interview a 73-years old designer, still active in the organisation, considered the "living diary" of Fritz Hansen. Even if the top management considered this designer an important source of knowledge, the director remarked that he had very strong opinions, and these were not always shared by the top management. In February 2013, he retired, and he wrote his personal greetings in the company's newspaper. The two times he came to the interviews, and from the later conversations, he was very prepared, bringing a lot of material from the basement. He provided me with a lot of old Fritz Hansen catalogues, with prices and colours from some of the years. From the interview and later conversations we had, he was found to be very enthusiastic and passionate both about the company and the products and he has been working very hard to preserve the documents

> *I went down in the basement and I found these old brochures. I can' t give to you because we don' t have copies, but you can keep them and you can see, you can make a scan of that. When I have finished with this story, I put on the bookshelves down there, but a lot of people take and bring around, and it is a total mess now... this morning I went down to find something... we are not able to find many of them. (...) look, this is a old catalogue from 1959(...)*[2]

At the same time, I had problems in asking him to go more in detail. That were still one of my first Ph.D interviews, and I was not trained nor experienced enough to push him more. When I was questioning about the relation of the company and Arne Jacobsen, both of the times I interviewed him, I got the following answer:

> *After that he became a very famous person and of course he we must listen more of what he was saying at the time. I have been able to touch him... I didn' t do... but I couldn' t have done... I was there, only a matter of distance...but normally his collaboration between the design and the company, it is better when we*

[2]interview with the former designer

have the same interest of course... so... at that time Arne Jacobsen spoke with the manufacturing himself not with all the other people around, not with Fritz Hansen... they were 2 brothers at the time they had the ... they spoke together with the designers.

The answers were coherent but not exhausting, and he insisted to tell me that he has been working all his life for the Arne Jacobsen' s chairs and as long as he is alive, he would continue to protect them. Maybe this was the reason he was acting as the gatekeeper of the basement. I was not allowed to have any document unless he wanted to give me. He contested the fact that in the PLC of the Egg the numbers were too low, by affirming that he remembered the warehouse full of Eggs, and he could not conceive why the production numbers were so low, and he did not think they were items not sold from the previous years, because they have never stopped the production. I asked him to provide me with the data of the sales number for the Serie7, but he gave me only partial data (only some years), therefore I had to calculate the rest of the PLC according to other information. After this initial experience, I realised I had to go back to the office and to the library, to read and study more my theoretical framework and delineating the fields in which I intended to make a contribution, so I could start to follow the actors, get documents and information concerning the things that were useful to answer my research questions. I decided to decrease for a while my presence in the field for concentrating on the theoretical aspects. Once I felt I could have elaborated them more, I went back in the field and I collected data in a more focused and systematic fashion, and I re-organised all the information I collected until that point.

What the ethnographer is in fact faced with - except when (as, of course, he must do) he is pursuing the more automatised routines of data collection is a multiplicity of complex conceptual structures, many of them superimposed upon or knotted into one another, which are at once strange, irregular, and inexplicit, and which he must contrive somehow first to grasp and then to render. And this is true at the most down-to-earth, jungle field work levels of his activity; interviewing informants, observing rituals, eliciting kin terms, tracing property lines, censusing households ... writing his journal. Doing ethnography is like trying to read (in the sense of construct a reading of) a manuscript - foreign, faded, full of ellipses, incoherencies, suspicious emendations, and tendentious commentaries, but written not in conventionalised

> *graphs of sound but in transient examples of shaped behaviour* (Geertz, 1973, pg. 10).

My aim was to follow the traces left by the actors, to contextualise and to narrate them. This is when I understood that photographic and historical ethnography were necessary. Data, like facts, are not independent (Latour and Woolgar, 1979), but they are representations of constructions (Garfinkel and Bittner, 1967). I always filled the field journal (already before approaching the company), and recording carefully what happened in the days, the attitude I had and the arisen problems. One of the first methodological difficulties has been related to understanding the representations of data.

> *Escape representation? Without wishing to try and escape representation, it is nonetheless worthwhile to pursue the possibility of developing alternative forms of literary expression. The idea is that this approach might modify existing conventions and thereby provide new ways of interrogating representations or to try to escape it* (Woolgar and Hamilton, 1988, pg.94).

Representations include languages, communication, written documents, visual recording, and gestures, and would be methodologically incorrect to assume that there is an *a priori* distinction between them (Latour, 2005). This is the reasoning justifying the use documents, journals, newspaper articles for my analysis, even if they are a partial representation of the reality and facts happened. As Professor Woolgar explained in class in Oxford, facts are

> *attempts to constitute facts include descriptions of the journey, unbiased witness, stories of its absence, stories of endurance, use of supporting witnesses, attention to mechanisms of recording, etc.*[3]

Then, in the middle of 2012, I realised I also needed to conduct an historical ethnography, and I started to collect data in a way that is proper of this method. One of the first considerations, was to be aware and keep the ethnographical distance to make some considerations, and reflections. I spent one semester in 2012 (August- December) by visiting regularly the company (minimum once per week for eight hours per day). I decided to focus my attentions only on documents present in the library or in the warehouse of the company. My interest was to follow the actors in the memory of the organisation. Surprisingly, nowadays the company has very little memory, not

[3]slide he projected in February 2013 in Oxford in during the class: advanced qualitative methods

only in terms of narrative, but also when they changed the computer system, there was no back up and data went lost; no one really knows the content of the museum, and there are very few stories and narratives on the past of Fritz Hansen. Therefore, I focused my attention on collecting the documents from the warehouse, enacting that particular documents to follow the actors as the organisational memory has collected them. The warehouse, where the documents were displaced, was constantly explored, documented, and classified, in particular newspapers, marketing material and brochures in two separate databases. During the winter semester 2012-2013, I collected (photocopied, scanned and took pictures) many documents, leaflets and the press release assembled by Søren Hansen and his secretary. In that period, my identity as researcher was renegotiated. I progressively stopped to wear the tag "visitor" I had to wear until that point, I got the Wi-Fi access as member of the organisation instead of as guest. I got invited to have a tour in the factory and even to benefit of the "company discount" (the members of the organisation can buy the items in the warehouse at a lower price compared to the market price). I considered that as a big improvement in the acceptance of my presence in the company. Since I became a bit skilled in Danish, I started to carefully note language's use in the organisation (Danish and English, the company's official languages). Following Garfinkel method (Garfinkel, 1967), I became aware that I was encountering documents or explanation of documents that were confronted by discrepancies, contradictions in organisational records, or different point of views in the same event. I recorded what was written, by whom, to whom, on what occasions. Besides that, I continued to interview people, sometimes officially (during booked meetings), other times informally; for example, at the table or chatting when they were available. My identity as researcher became "updated" when I told to some people I was going to Oxford for my visiting period, and I would certainly visited the Saint Catherine College (designed and furnished by Arne Jacobsen, with the chairs still in production). During the PhD, I was presenting the preliminary findings, reflections, developments in the literature review to the steering committee every six months, composed of my two supervisors and the executive board of the company. I was receiving feedbacks, suggestions about where to find missing data, who I should interview, and what they would like to understand from the data, how their expectations changed and what sparkled their curiosity. The marketing director was very interested in knowing which have been the framing devices and how they have changed their role. At the end of October 2013 I had a meeting with my supervisor and the managers from each function to present the preliminary conclusions. They validated them, they were very positive on the managerial implications

and I was asked to come back in six months with an action plan. The data have been complemented with twenty-two interviews (some persons has been interviewed twice or three times: the design manager, the graphic designer, a professor, the retired designer) of length between 1 hour and 2 hours and half, have been recorded, transcribed, coded, and analysed with a special software for qualitative research (Dedoose). The interviews were semistructured interviews (Kvale and Brinkmann, 2009), all recorded, and most of them transcribed. I prepared a list of questions that I intended to use to lead the discussion (Kvale and Brinkmann, 2009), which was double checked by my supervisors. The interviewees were chosen based on selective criteria, and not like a snowball sampling (Noy, 2008). The list of the persons interviews is presented in the following table:

Date	Interview with	Date	Interview with
June 2011	Retired graphic designer	July 2012	Professor Catalani, design management Bocconi University
June 2011	Sale person at the auction house Rasmussen (Informal interview)	July 2012	Professor Francalanci, IUAV, expert in design for the Biennale
June 2011	Informal interview with the assistant at the Danish Design Centre	July 2012	Professor Guerzoni, Bocconi University, design expert, Venice
June 2011	Shop assistant at Illum Bolighus	September 2012	HR manager
June 2011	Brand Manager	October 2012	CFO
June 2011	Two math students	October 2012	Marketing manager
June 2011	Head of Design	October 2012	Design manager
June 2011	Retired graphic designer	February 2013	Librarian at St. Catherine College
June 2011	Brand Operations	February 2013	Designer and shop owner in Woodstock
July 2011	Kasper Salto	March 2013	Sales person of the flag shop of Fritz Hansen, London
September 2011	Former Design Manager	March 2013	Customers in the shop in London
October 2011	Personal Assistant of the CEO	April 2013	Manager of the shop of Fritz Hansen in Milano
November 2011	Retired graphic designer (in danish)	April 2013	Assistant of the shop manager in Milano
November 2011	Librarian at the Museum of Industrial Design (CPH)	December 2013	Three Danish customers

Table 4.1. Overview of the Interviews. Semi-structured formal and informal interviews conducted.

I have analysed the sources, considering taking these documents as texts and artefacts that can be read as representational aspects of the social world.

I have used both formal sources, such as the accounting documents and the minutes from the meetings, radio and television documentaries, and more informal records, such as letters, photographs not meant for public access when they were produced - but accessible now to the public - letters, newspapers, and magazines. Moreover, I visited the shops in UK, France, Spain, Italy, and Denmark. I spoke with the managers of the showrooms, with the shops assistants, and sometimes also with customers in the shops to understand the prancing process nowadays (this achieved by using ethnomethodology). I felt like a detective while I was looking for sources and evidences, digging in the organisation and the evidences, since a wide range of them were mute sources and it was a very meticulous work to follow the traces left by the actors. These sources raised questions about nature of evidence. Following the actors and their network construction was challenging. Latour (1988) admits that these is an endless number of actors, so putting a limit is always complicate: inserting boundaries in the network is one of the biggest challenges, so the research in the field stopped when there was the sensation of having enough material to enact reality, and focus on the analysis and on the writing. These were some of the questions and issues I discussed with my supervisors. One of the biggest steps in ethnographic research is to code to have a systematic approach to the analysis and interpret the data in a systematic fashion. I went through three cycles of coding. In the next section, I describe what coding is and how I used it.

4.5 Analysis

Throughout the process of data collection, coding and analysis, a memoing was created and in that space I was reflecting on what I was learning from the data and how I could use the theory, since analytical memos are supposed to be sites of self conversation for the researcher (Saldana, 2011). In the memo, I have reflected and written about the relations of the actors and the phenomenon, about the codes and the implications for the research, the possible links with the literature, the emerging patterns, the future directions for the study and the writing process. The data were divided into meaningful analytical units, and were coded creating the segments of data with symbols, descriptive words, and category names. According to the definition,

> *a code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data. The data can insist of interview transcripts, participant*

> *observation field notes, journals, document, literature, artefacts, photographs, video, website, e-mail correspondence and so on* (Saldana, 2011, pg. 3)

Coding is an iterative problem-solving technique to link the idea to the data, the data to the analysis and to the research questions, connecting the elements of the thesis in a systematic order. I did several cycles of coding. The first cycle of coding was done before the literature review was extensively written when I still had a vague idea of what the domain literature should be, and which meta-theory I wanted to use, and the second round of coding was conducted in parallel with and after the writing of the literature review, as

> *if we approach the task with an exact and rigid set of ideas, we may simply confirm and perpetuate our prejudices (and our errors). Paradoxically, the more we know about theory, research, and methodology related to our question, the less we can see with the data with a "truly" innocent eye. Yet the notion of an innocent eye is a shaky construct. Prior knowledge is always in the background, or unconsciously, when approaching coding. The more we add to our repertoire of knowledge, the more baggage there is for categorising data* (Sipe and Ghiso, 2004, pg. 484).

The first round of coding was done taking inspiration from by simultaneous coding, attribute coding, descriptive coding, value coding, attribute coding. The data turned out to be a complex and ongoing process, a judgment call (Sipe and Ghiso, 2004), in which the researcher brings his/her personality, predispositions and peculiarities.

Attribute coding describes the demographic attributes of the population: I mapped the actors and the features associated and disassociated.

Simultaneous coding is the application of two or more different codes to a single qualitative datum (Saldana, 2011).

Descriptive coding

> *summaries in a word or short phrase- most often as a noun- the basic topic of passage of qualitative data(...) It is important that these codes are identifications of the topic, not abbreviation of the content. The topic is what is talked or written about* (Saldana, 2011, pg. 70).

Value coding, as described in Saldana (2011), is an application of codes into a qualitative data that reflects on a participant's values and attitudes, but it is given by the researcher. It is applicable to interviews and field notes.
During the first cycle of coding, the list of the codes was very long and difficult to manage. I first proceeded by categorising (putting codes under the same category), grouping the codes in categories of human actors/ non-human actors/qualities.
I started to write the analysis by narrating the episode of each chair, analysing actors, descriptions, instruments, inscriptions, spokespersons, enrolment processes, mobilisations, interessement process, translations, black boxes, framing devices, valuing, technologies of managing. But I recognised, also thanks to the feedbacks from my supervisors, that it was messy, unclear, confusing and hard to distinguish the reasoning behind each paragraph.

Therefore, I started to look again at the data and do another cycle of coding and anchoring better to the research dilemma. The scope of the second cycle coding is to develop conceptual and theoretic organisation from the first cycle of coding (Saldana, 2011).
The second cycle of coding allowed to develop and to analyse not only by breaking down the first cycle coding, but also assembling and synthesising and grouping similar codes. Furthermore, I included some of the missing pictures, refined some of the codes which were too broad and not useful for the analysis. So, I modified them along the way when interesting things were emerging from the analysis, and proceeding with theoretical coding.
Theoretical coding integrates the categories and links them to the central core category. It can be made as an extended narrative or made a set of propositions (Saldana, 2011).

> *For ethnographers, several implications about the nature and process of coding data can be drawn from this narrative. Building conceptual categories is an intellectual challenge that demands all the creative energies researcher can bring to the task; it is not a dull and mechanic exercise at any point* (Sipe and Ghiso, 2004, pg. 483).

The third round of coding was developed after properly defining the analytical framework (October 2013). The database that was coded resulted composed of 65 pictures collected in museums; 563 records concerning book on Danish Design and Arne Jacobsen; 1219 pictures taken in the warehouse; 246 records of different internal documents, including reports, minutes, interviews, financial documents, financial statements and presentations. In the analysis, the document used as reference have the ID in the database.

I went through each record, translated from Danish, Norwegian, French, Spanish, Italian to English. I omitted Swedish and German documents, since I could not understand them. I have exported the data in Dedoose in a new project, with new memos, following the code created for the third round of coding:

a) actors; b) black box; c) interessement (including enrolling/translating); d) funnel of interests; e) instruments; f) moment of designing;

Once the initial narration was written, than it was recoded with a fourth (and final) round of coding, reflecting the research question: a)actors and networks, b) translations, mobilisation, enrolment, spokespersons) features associated and disassociated and dividing them in the episodes they were referring, according to the event narrated and the year of publication.

4.6 Writing (up)

The writing up process of the literature review and of the theoretical framework has been discussed in the previous chapters. Chapter five is about the analysis. The chapter is divided into three main sections, each corresponding to the analysis of a chair. The chairs have their life cycle, and this tool has been used to identify the episodes interesting to be investigated and dictated by the changes in the PLC curve. The idea of identifying units of analysis is inspired by Christiansen et al. (2010). The units of analysis are called episodes, term taken from a previous study by Latour (1987). For the Egg and the Ice chair, the sales data were given by the company, or found in the basement. For the Serie7, the process of designing the PLC was more complex, because the sales numbers were missing and some sales number found in a document were incoherent with the data found in another one. Therefore, I have written the sales numbers that were matching, I calculated the growth rate and made an INTERPOL to calculate the missing numbers. After, a trend line was drawn, to make these results less dramatic: some of the years might have been biased by the change of management, or not correctly reported, or miscalculated. The analysis was written by following the codes and identifying the data belonging to each episode. This research has an abundance of translations: from one mode of existence to another; from a context to another; from one language to another; from the documents, the minutes from the meetings, technicalities of design, the manufacturing machines, whose use was translated since they were unfamiliar to me. As ethnographer, I translated my position during the interviews and during the field work in the company and in the shops, I tried to renegotiate my posi-

tion, by being interested in the details, ask explanations on how things were done, and never why. If I would have asked why, the persons could have become reluctant to talk because they could have felt judged in their work, while by asking how, I shared interest in their jobs and activities (Kvale and Brinkmann, 2009).

The translations from Danish to English, from Italian to English and from Danish to Italian have been part of the process.

As an ethnographer, I learned the language to become a member of the organisation. It was not required, but being all Danes, they were speaking Danish among them. Then, I started to translate the documents from Danish to English, but many words were new in English to me. Italian being my mother tongue, I took my fields notes half in English and half in Italian so I could have my own language for understanding and not be afraid that people in the company could read and misinterpret my field journal. The interviews were conducted in English, Italian, and twice in Danish. The strategy I chose for the translation and the analysis was to make an English translation using the philosophy of the English school of translations: try to understand the meaning of the sentence said in the mother tongue and then try to find similar expression in English, without translating literally.[4] Finally, I worked on translating the data into information for the analysis. In the analysis, quotes from the interviews, journals, newspapers are reported, since in ANT the analysis happens through the narratives, and the work of the researcher is to connect the narratives to understand the network (Callon, 1986).

[4]discussion I had with Steve Woolgar in Oxford, during the ethnographic course

5
Analysis: Episodes

5.1 Introduction to the analysis

The analysis of three chairs (Serie7, Egg, Ice) aims at answering the research questions:

1. Who are the actors in the networks?
2. What translations, mobilisation, enrolment, spokespersons can be identified?
3. Which are the features of the products that are associated and disassociated?

to explain the problem statement *how does a design product emerge if it considered and understood as a network effect, and what are the managerial implications?*
The form chosen for presenting the analysis is the narrative, because it allows to describe facts not

> *simply as matter of facts but always as matters of concern, with their mode of fabrication and their stabilising mechanisms clearly visible* (Latour, 2005, pg. 120)

Narrating is a matter of re-drawing or negotiating the boundaries between the researcher and the data. It is an analytical as well as a practical undertaking of de-coding (de-scripting) of facts that are matters of concern (Latour, 1987). Therefore, narration is more than a simple explanation or description.
The episodes for the analysis have been selected by looking at the changes

in the shape of the PLC; therefore, the PLC is translated from being a technology of managing[1] into a device to identify interesting episodes. The analysis aims at demonstrating how different things happened through the understanding of the translations, the mobilisations, the enrolments, the spokespersons, and the features associated or disassociated for each episode. The chairs, the number of items sold, the way they are framed, are all results of a networks formation, of the strengths of the allies' relations and of the involvement of the spokespersons. This way of analysing the design process is different from the way that has been described in the literature of design management, where it is intended as a stage process or a rational decision making, without a clear role for the managers (what do they actually do? Which actions do they take? How can be the object actively managed during its PLC, without abandoning it in the hands of customers?). Based on the analytical framework analysed in the Section 3.3 (at page 146), the analysis proceeds as follow: for each chair it will be provided with the PLC with the episodes to be analysed and for each episode, as explained in the analytical framework, the following are analysed:

- Allies in the network during the episode
- Translations, enrolment, mobilisation
- Spokespersons
- Features associated and disassociated

5.2 Serie7

The following figure represents the PLC of the Serie7 with the identified episodes that are analysed.

[1] see Chapter 2

Figure 5.1. PLC of the Serie7, episodes identified.

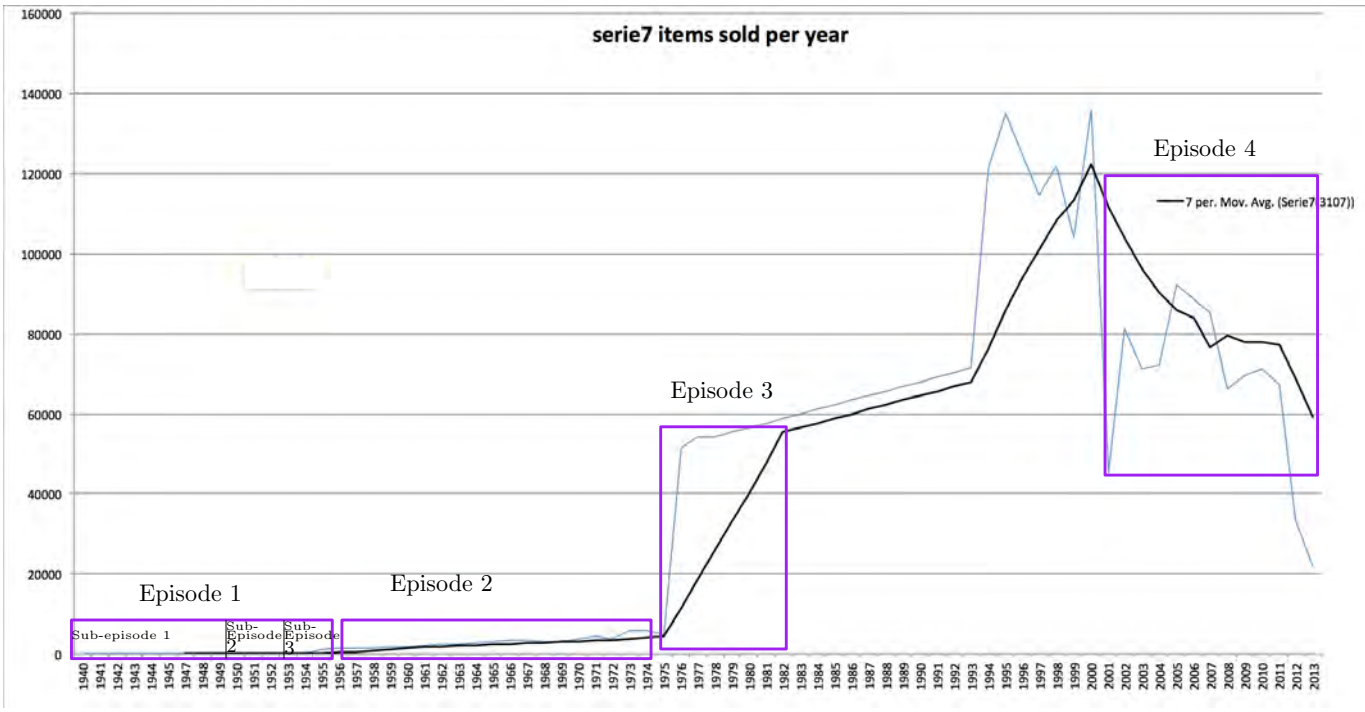

Figure 5.2. Picture of the Serie7 at Louisiana museum, showing the different types of wood used.

The Serie7 is a plywood chair manufactured by Fritz Hansen Eft. and introduced in the market in 1955. The Serie7 is the result of the translations of the Ant chair to enrol and hush the customers that were making the networks of the chair unstable by criticising the three legs and the lack of armrest[2].

[2]interview with the former designer working in Fritz Hansen

5.2.1 Episode 1: The design of the product (1932-1955)

The analysis of this episode is focused on the periods preceding the presentation of the Serie7 at the H55, the exhibition in Helsingør in 1955. This figure shows the allies enrolled and their relationships in the development of the Serie7, covering a period of more than 20 years.

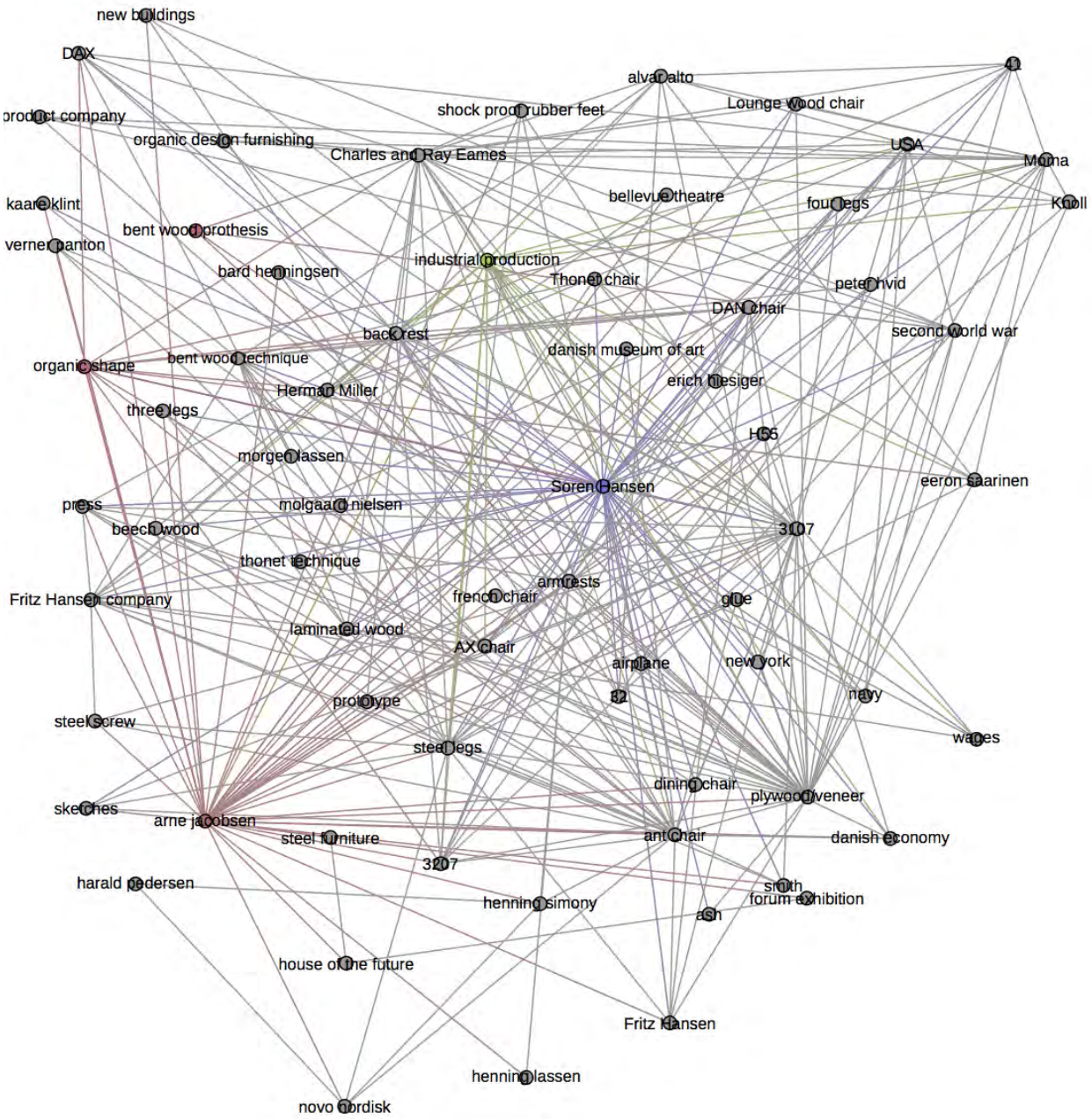

Figure 5.3. Allies in the network, first episode. Network showing the allies enrolled and their relationships in the development of the Serie7, covering a period of 15 years.

Due to the size of the network, this episode has been divided into three sub-episodes presented in chronological order:

- 1932-1949: the episode in which the plywood, the material used for the Serie7, was developed and the actor organic design became black boxed;

- 1950-1952: the episode in which the Ant, the first organic chair in plywood was designed, manufactured and launched in the market. The Ant was the first chair designed in plywood in Denmark
- 1953-1955: the episode in which the Serie7 was designed to satisfy the complaints of the customers, who wanted the Ant with armrests and four legs but Arne Jacobsen refused to insert because they would have changed the design of the chair.

5.2.1.1 1932-1949: First sub-episode: The development of the plywood and the design definition: organic design

Allies in the network The following table represents the allies in the network that supported the development of the plywood and the acceptance of its use in the furniture. Søren Hansen was in USA and he became interested in the plywood by the Eames's chairs exposed at MoMA[3]. He decided to bring some of the chairs to Denmark to displace this new material which was considered a breakthrough innovation in Denmark.

Alvar Aalto	Air propellers	American Army	Bent wood
Chair n'41	Chair n'32	Charles Eames	Cranbook academy of art
DCW chair	DCM Chair	Eames Moulded Wood Side Chair	Eeron Saarinen
Facilities for manufacturing	Fashion magazines	Herman Miller company	Knoll furniture company
LCM by Eames	LCW chair	MoMA	Newspaper articles
Noyes	New York	**Organic design**	Prothesis for the soldiers
Prototypes for the exhibition in MoMa made of plywood by Eames and Saarinen	Ray Eames	Refugees	Second World War
Shock proof rubber feet	Steam bending beech	Tubular metal legs	Tubular wood legs

Table 5.1. Allies and black boxes in the network of plywood. The allies in the network in blue are human allies, the red ones are non-human allies and the black one is a black box.

Translations, mobilisation, enrolment The following figure represents the translation processes that made the plywood from being experimental

[3]cat_94: Politiken 7/4/65: Møbelbogen

and cabinet-maker material to a material suitable for being used in the industry of modern manufacturing.

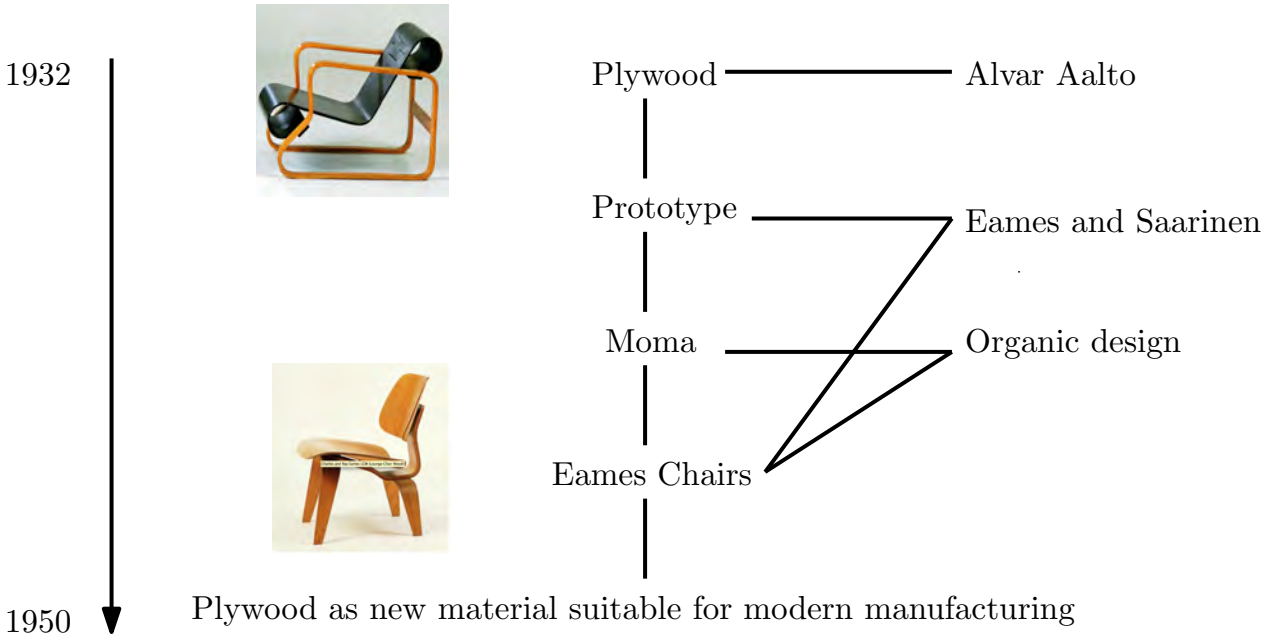

Figure 5.4. Translations, plywood episode. Overview of translations that the plywood went through from being used as handcraft to be used in industrial design, making modern manufacturing of chairs possible.

Søren Hansen, manager of Fritz Hansen Company in the 1950s and 1960s, was born in 1872 in Nakskov; he studied applied arts in Christianshavn, and graduated as cabinetmaker, and afterwards he moved to Paris where he opened a design office, then he went to New York where he lived for some years as designer.[4] When he was in New York, he often went to the Metropolitan Museum of Modern Art (MoMA).[5] The Metropolitan Museum of Modern Art framed those interested in design to consider it not only as an ornament, but also something usable, functional, and commercial. American retailers were enrolled in the network of new modern and industrial design, and they started to display items in the shops and in the windows of the department stores.[6] Søren Hansen liked this kind of staging and he translated it in the Fritz Hansen shops when he became manager.[7]
In 1939, MoMA sponsored an exhibition of Scandinavian design, with Alvar Aalto as curator. This exhibition mobilised Søren Hansen as visitor of the

[4]cat_104:Jyllandsposten 3/4/65: et eventyr om møbler
[5]field note taken in the warehouse in Lillerød
[6]Raizman (2004)
[7]pictures of the shops from the museum of Fritz Hansen

museum.[8]
Alvar Aalto was a Finnish designer who emigrated in the USA in 1935. He designed chairs made with the bent wood technique, and he was the first one to realise models for manufacturing with aesthetic plain surfaces and absent decorations;[9] he began to investigate the bending veneer technique and the use of plywood. In 1932, he made the chairs n'41 and n'32 using plywood as material.[10] He was a technical innovator of the chairs,[11] where **technical** is defined as

> *a unique ability to make oneself indispensable, to occupy privileged though inferior position that I have called, borrowing from the military term, obligatory passage points* (Latour, 1994, pg.43).

Alvar Aalto became a mediator of the technique of laminated wood using massive tree, and he made it circulating and redistributing by teaching the technique to the students of architecture at MIT and Cranbrook Academy of Art, including Eero Sarineen and the Eames.[12]He was not a spokesperson for the network of plywood because he did not have enough allies supporting him, and he did not develop the plywood to a manufacturing technique. But he was conveying and translating information, allowing the Eames and Saarinen to become the spokespersons of the network. He was one of the judges at the competition Organic design held in MoMA in 1940.[13]
The museum of Modern Art in New York was aware of the advent of biomorphic forms in design, and in 1940 it held a competition, "organic design in home furnishing" that produced an exhibition the following year. The definition used for organic design was: *a design can be called organic if, within the object as a whole, there is a harmonious relationship between the individual elements as regards structure, material and purpose*;[14] Knoll furniture became interested in the event and agreed to manufacture the winning chairs. The aim of the exhibition was to interess actors in the network of modern design by demonstrating that the designers and the manufactures were able to meet the practical needs of modern living and to use technology and modern methods of manufacturing. One of the curators, Noyes (1910-1977), was mediating the term organic, and after the exhibition, it became a black box

[8]information available in the minutes of the meetings, 1951
[9]interview with Catalani
[10]Fleig (1975)
[11]interview with Catalani and 1st interview with Francalanci; cat_275: deres kvinder 10/7/1959, nye materialer, ny teknik, nye møbler, af Birte Rohweder
[12]Wolfe (1981)
[13]cat_275: deres kvinder 10/7/1959 nye materialer, ny teknik, nye møbler, af Birte Rohweder
[14]bk_63; 86, from the book Thau et al. (2001)

(Latour, 1999). Noyes intended to find organic and novel furniture to be mass produced (to reduce the cost per item) and used in the IBM offices for formulating a united design policy for IBM. The term organic, after the exhibition, became black boxed, stable, accepted and understood as moulded forms that were manufactured using industrial processes and materials (such as laminated woods). This technique allowed flexibility and muddles for furniture and storage pieces that could be easily constructed and configured in a variety of ways. [15] The chairs designed by Eero Saarinen and Charles Eames made of plywood won the first price. The chairs were framed as simple, sweeping, arching structural curves and machine-like rationalism,[16] made of padded double-curved plywood shells. After the exhibition, they designed the Organic Armchair (1940/1). The designers had difficulties in forming a complete chair shell with complex curve from plywood because they could not design a convex form that could be too strong to support the structure,[17] and therefore they treated the two shells (the back and the seat) independently. The design was modular, and the designers presented the chair in two combinations: the legs were available in laminated wood or metal. These were initially attached with elastic rubber shock mounts that were firmly welded to the wood using a modified Chrysler process.
Magazines such as Vogue and Vanity Fair used pictures and illustrations to promote the image of modern design and chairs exhibited at MoMA and to associate it with fashion. After the exhibition, because of the Second World War, Charles and Ray started to work on prototypes of leg splints made of plywood for injured soldiers. In November 1942, they received from the Navy the first order for 5,000 moulded plywood leg splints. Together with former colleagues, they set up a production company and a research lab, the Plyformed Wood Company.[18] Charles Eames became head of research in the Moulded Plywood Division at the Evans Product Company, which also developed moulded plywood parts for airplanes and the gluing technique for holding them together. They conducted numerous researches, they experimented with moulded plywood; at the end of the war they translated the discoveries and techniques into the field of furniture.[19] The management judged the plywood as a good material because it ensured economical profit (economies of scale, usable for the mass production of furniture, lower cost per unit produced), and at the same time offered comfort since the furniture

[15] Raizman (2004) pg. 232
[16] Saarinen et al. (2006)
[17] first interview with Francalancia
[18] material from the Vitra museum-online, 10th of November 2013
[19] From the book: modern design

could be moulded to the human body.[20] During and immediately after the end of the Second World War, they Plywood company decided to invest on the development of this material in the furniture industry because there was the need of manufacturing inexpensive and fashionable furniture while taking into account the general scarcity of raw materials; therefore the plywood was considered a good source of raw material.[21] They experimented with upholstered chairs made of steam-bent plywood intended for industrial manufacture. As the use of double bending in manufacturing was still limited, the Eames decided to keep separated the seat and back, both relatively flat, hung on a tubular steel frame. The chairs were produced with armchair (LCM) and as dining chair (DCM).[22] These were considered real innovation in the furniture industry.[23]
In the autumn of 1945, Moulded Plywood Division produced a number of chairs and armchairs from a wide variety of woods, with fabric, imitation of leather, leather, or hide coverings for the seat and backrest. The prototypes were presented to the press in December 1945 at a preview showing at the Barclay Hotel in New York.[24] In February 1946 they were displayed at an Architectural League exhibition and finally, in March 1946, in a solo MoMA exhibition entitled "New Furniture – Designed by Charles Eames" in New York. After having attended this exhibition, Herman Miller Company got interested and decided to become partner for manufacturing some of these models.[25]
Søren Hansen was in USA during the exhibitions and he got interested in the modern design and in the use of the plywood. The chairs mediated the access to plywood for Søren Hansen, displaced at the exhibitions and throughout the manufacturing, he bought some of them, brought them back to Denmark and displaced them.[26]

Spokespersons The spokespersons for this episode, in which the plywood as furniture material was developed, were Charles Eames, Ray Eames, Eero Saarinen (managers at the Plywood company) and the curator of MoMA, Noyes, who was also board member at IBM. The spokespersons were support-

[20]second interview with Francalancia

[21]Vitra Museum online, http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/lcw-lounge-chair-wood-eames.html, 19th October 2013

[22]Vitra Museum online, http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/lcw-lounge-chair-wood-eames.html, 19th October 2013

[23]interview with Catalani

[24]material from the kunstindustrimuseet

[25]interview with Catalani

[26]interview with the librarian at the kunstindustrimuseet

ing the use of plywood in the furniture industry, promoting the conversion of a wartime material into a civil-use material. After the war, there was an increase of the use for manufacturing due to the economic boom after the war and the consequent need of having furniture that were possible to be produced at a faster pace, at lower cost, and could be sold at a low price to the corporate buildings that were expanding and to the refugees who emigrated to USA during and after the war. [27]

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept and develop the plywood as material for the furniture industry.

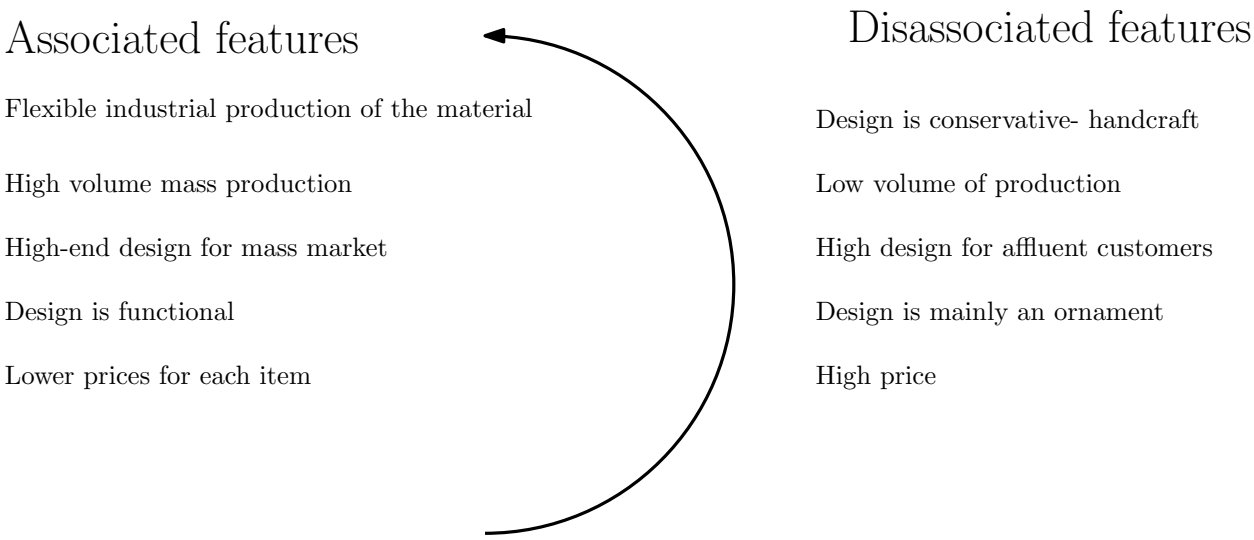

Figure 5.5. Design features as an outcome of choices, plywood episode. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of adopting (and adapting) the plywood in the furniture industry, after the Second World War.

The spokespersons worked for and promoted the features of the plywood being flexible for the industrial production, allowing high volume mass production, and decreasing the price for item, for the design to become an actor for the mass market, and only for few wealthy persons; the design produced using the plywood was functional. This programme of action reflected the goals displaced by the USA government, which wanted to support the development of the manufacturing productions, finding cheap solutions for the

[27]The USA government was supporting of this policy, in order to offer decent living conditions to the persons who arrived

refugees escaping from the war zones and emigrating in USA. The new furniture was not only functional, but was also a nicely made and affordable design item. This was in contrast to the program of action of actors supporting the design of the end of the 19th century, which was made of precious wood. It was considered like an art object, handcraft, produced in small quantities, for wealthy customers that were willing to pay a high price. The spokespersons worked to frame the plywood also by disassociating from the features associated to the hardwood.

5.2.1.2 1950-1952: second sub-episode: the development of the Ant

Allies in the network The following table represents the allies in the network that supported the development of the Ant chair, designed by Arne Jacobsen, made of plywood and manufactured by Fritz Hansen.

Architects associations	Arne Jacobsen	Arne Jacobsen assistants	Axel Pedersen
AX chairs	Beech	Bellavista chair	Bent wood
DCM by Eames	DCW by Eames	Design competitions	Different woods for the external and internal layers of the plywood
Dreadful winters	Flemming Lassen	Fritz Hansen	Fritz Hansen Company
French cafe chairs	Glue for the plywood	Henning Lassen	Henning Simony
House of the Future	Increase of the salary	LCM by Eames	LCW by Eames
Machineries for manufacturing	New buildings and houses	New York	Newspaper articles
Novo Nordisk and its canteen	**Organic design**	Press	Plywood
Rotary Club	Second World War	Shock proof rubber feet	Steam bending beech
Steel screws	Søren Hansen	Tabular metal legs	Thonet technique (Thonet Mundus patent)
Workers in the moulding of the plywood	Verner Panton	All the instruments used in the prototyping phase	All the machines use for producing the chairs

Table 5.2. Allies and black boxes in the network of the Ant chair. The allies in the network in blue are human allies, the red ones are non human allies and the black one is a black box.

Translations, mobilisation, enrolment The following figure represents the translations that lead to the development of the Ant chair. Fritz and Søren Hansen were mobilised by the increase of the production costs, and enrolled by the Eames's chairs that mediated the access to plywood and of the black box organic design.

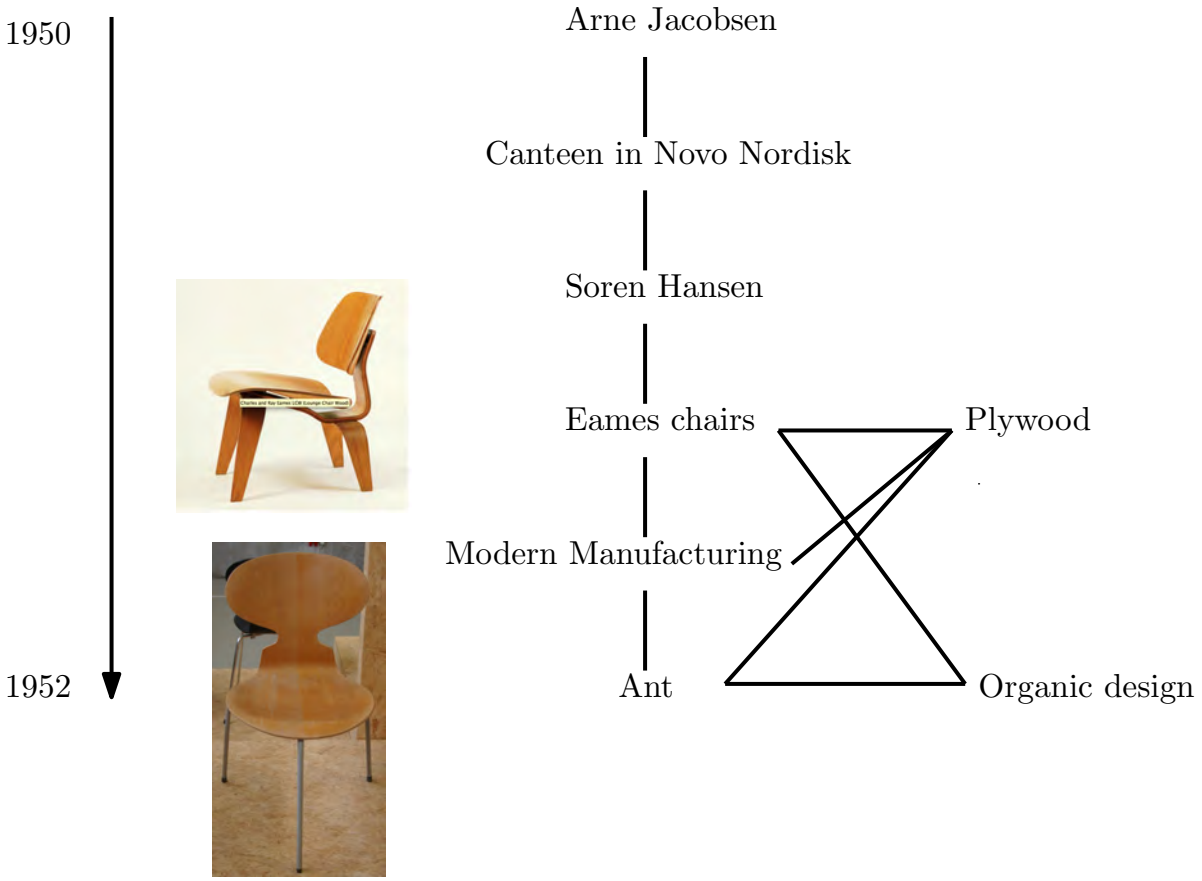

Figure 5.6. Translations, Ant episode. Overview of translations that Arne Jacobsen initiated, involving Søren Hansen, which produced the Ant.

Henning Simony, manager of Novo Nordisk pharmaceutical company, met Arne Jacobsen at the Rotary Club after the Second World War, and he hired him to build his villa. Being satisfied with the building, he decided with Harald Pedersen to hire him also for the construction of a new factory,[28] including the canteen for the employees. After the war, Novo was restructured to cope with its growing sales creating a dynamic, product-oriented organisation, and a new factory to cope with the increase of the demand.[29] Arne Jacobsen was considered a trustful architect by the Danish Architects

[28]Thau et al. (2001)
[29]Novo Nordisk financial statement 2009

since the realisation of the "House of the Future". The House of the Future was the first modern house in Denmark designed by Arne Jacobsen and Flemming Lassen for Forum exhibition in 1929, organised by Copenhagen Academics Architects Association, called *Architects Building and Housing Exhibition.* The call for projects stated: "ideal house, arranging the home as one might wish after removing technical and practical barriers that today's deficient technology and legislation impose." On the top of the house, there was a helicopter-landing space.[30] The House of the Future was described by the press as a novel way to present the buildings.[31] The use of lights and neon for lightening was inspired by Marinetti in the Manifest of Futurism. The furniture of the House was an effort to overcome the existing technology in the furniture industry; the shape of the house was dynamic spiral, concentric, contrasted by vertical lines.[32] A journalist of the newspaper Politiken,[33] in a column dedicated to the review of the exhibition, commented that the House of the Future could be indicated as the House of 1980, and the people visiting that exhibition could understand the accounts in which the population would live one day. Each room was designed to follow the sun light: the kitchen and the dining room on the west part, the gym and the rest room furnished with inflatable rubber mattresses on the east part, the garage and the entrance with speakers for announcing the guests on the north part. The heating was positioned on the floor, a steel desk and a modern typewriter in the smoking room, and a pneumatic tube ending at the local post office was situated in the studio. The chairs were built of nickel, with plated steel tubing legs, and the seat in leather. The tables were made of glass, conveying a light touch. These surfaces (chairs and tables) were considered highly hygienic, since they were hard surfaces easy and unproblematic to clean. The press called Arne Jacobsen "funkis", referring to him as the Danish Courbousier. The features of the House of the Future were translated into the factory of Novo Nordisk and its canteen.[34]

When Jacobsen started to plan the canteen for Novo Nordisk, he intended to find a chair that was stackable, lightweight and easy to move for the cleaning of the room.[35] He approached Søren Hansen asking for suggestions and models available[36]. The two men met professionally for the first time when Jacobsen designed the Bellevue chair in 1935 for the Bellevue Theatre;

[30]Thau et al. (2001)

[31]Newspapers conserved at the Royal Academy of Art

[32]Thau et al. (2001)

[33]Thau et al, 2001

[34]Field note from the visit in the museum in Allerød

[35]field note taken in Oxford

[36]interview with the former internal designer in Fritz Hansen

after that occasion, he had frequent contacts with Søren Hansen through the architects and manufacturers associations, since they both were members.[37] Søren Hansen showed the chairs that he had available in the production, proposing the AX chair that was one of the best seller in the United States[38] The AX chair, designed by Peter Hvidt and Orla Molgaard Nielsen, was a stackable chair constructed modularly, a solution for shipping easily to USA. Søren Hansen showed it as a possible alternative for the Novo Nordisk canteen, but Arne Jacobsen was looking for something more modern that could fit into his buildings. Arne Jacobsen was not impressed by the chair,[39] and he decided to look for the chair also in other companies, but unsuccessfully.[40]

Søren Hansen had the intention to develop an industrial design chair to be produced in large quantities, and not produced with the bent wood technique, designed by architects and not cabinetmakers, to increase the quality and the comfort thanks to the new studies on ergonomics[41] that were developing in the architectural schools. He was aware of the new industrial possibilities for the modern furniture industry (he was interested by the actor "organic design") and he was willing to produce modern furniture to increase the sales not only in New York, but also in Europe.[42] Fritz Hansen Company was manufacturing furniture with an industrial process: Fritz Hansen, Søren Hansen's father transformed the cabinet-maker production of chairs from handcrafted into industrial. After the First World War (1934), Fritz Hansen bought the patent "Thonet Mundus" from the Thonet company[43] for the production of bent wood chairs and hired a machine engineer (Erich Hiesiger)[44] to move from Thonet Company (in Austria) to Fritz Hansen to teach how to use the machineries and maintain them.[45] In the furniture industry, the most important manufacturing of chairs was started by the German cabinetmaker, Thonet, who was able to produce good-quality and appealing chairs made of steam bent wood.[46] The Thonet family had factories in Czechoslovakia and Austria producing chairs on a large scale, the so-called Winer chairs. The Thonet factories produced 18,000 chairs a day and employed 22,000 persons.

[37]field diary, visit at the factory in Lillerød

[38]information found in the warehouse

[39]Interview with the former internal designer in Fritz Hansen

[40]field diary, visit at the factory in Lillerød

[41]field note from Allerød museum

[42]field diary, Allerød

[43]Korte træk af en lang historie

[44]cat_101: Belingske tidende (13/4/65): Disponent Erich Hiesiger; Politiken (13/4/65) Disponent Erich Hiesiger; Børsen (13/4/65) Disponent Erich Hiesiger

[45]field diary, Oxford, Information found at the Allerød Museum

[46]Bang (1979)

[47] Fritz Hansen saw an opportunity in this business, and he was the first manufacturer acquiring the patent for the bent wood technique in Denmark. [48]

The Thonet technique was a production method that allowed to have chairs manufactured industrially, thanks to the capability of bending the massive tree, with the use of the steam of boiling liquid, avoiding the breakage of the outside of the curve.[49] The patent made Fritz Hansen Company the first company in Denmark which produced steam bent furniture. Hansen experimented in these years with the bending of the trees because even if Fritz Hansen acquired the patent, it had to adapt it to different native timbers through a number of trials before the first Danish chair came into production, becoming the first company in Denmark able to produce bent wood furniture. However, Fritz Hansen went through legal issues because Thonet accused the Danish company to have plagiarised the Wiener chair with the model designed by Morgens Lassen.

The increase of salary after the Second World War was an actor that entered in the network of the chair makers using the bent wood technique and made it collapsing: the bent wood chairs became too expensive to be produced because the cost of man-hour per chair was higher than the selling price, they could not be produced in such a quantity to satisfy the boom of the demand after the War; this reasons, together with the damages occurred during the war, made Thonet go into bankruptcy.

Fritz Hansen was in favourable economic conditions since it was one of the few manufacturing companies in Denmark that had a big stock of wood during the blight of trees that affected the prices of raw material, thus one of the few willing to invest in the production of new chairs.[50]

Therefore, Søren Hansen looked for new opportunities to transform the current production[51] into more automised production in order to 1) decrease the number of man-hour per chair to avoid a similar faith of the Thonet factory and 2) to satisfy the increase of the demand of modern furniture.[52] Søren and Fritz Hansen were looking for architects with solutions for producing a chair using a rational industrial production.[53] The aim of Søren Hansen was to enrol an architect in his trials of struggles and chain of arguments, and he mobilised Arne Jacobsen's interests to develop a chair able to sustain both

[47] Korte træk af en lang historie

[48] information displayed in the museum in Allerød

[49] Korte træk af en lang historie

[50] minutes from the meetings, 1954

[51] Korte træk af en lang historie

[52] archives of the national library

[53] cat_125: Manden bag stolen

arguments. Arne Jacobsen, once he decided to design the chairs instead of looking for one already present in the market, went to France to find the inspiration for a good cafe chair. He made some drawings during the travel, but he was not satisfied with the qualities he wanted to inscribe.[54] The chair he was drawing had similar characteristics of the chairs for sidewalk cafés: utilitarian but lacked of aesthetic and innovativeness; stackable but were considered anonymous design for terraces.[55] Arne Jacobsen went back to the office, he showed the sketches he made to his six collaborators, among whom were Henning Lassen and Verner Panton. Verner Panton was the one in charge of the preparatory drawings, and he made a number of sketches that was so consistent to fill up a couple of boxes on his desk.[56] Jacobsen and Panton chose only one of them and sent it to the smith to have a full-size prototype. When the smith returned to the workshop with the prototype, Arne Jacobsen was not satisfied.[57] Arne Jacobsen mobilised Søren Hansen for the preparation of new drawings, explaining him that he was not satisfied by the ideas he was having and constrained by the limits of the bent wood [58]. Søren Hansen showed him the chairs he brought from America: the chairs of Charles and Ray Eames and Eero Saarinen. Arne Jacobsen was enrolled in the bent plywood of the Eames chairs. Arne Jacobsen and Søren Hansen in order to reach their goals needed to take a detour, to size up each other (Latour, 1999), and to translate them into the a new chair. Arne Jacobsen had the goal of furnishing the Novo Nordisk canteen with modern furniture; Søren Hansen had the goal of hiring architects for designing the chairs and overcome the constraints of the Thonet technique. Søren Hansen mobilised the Eames'chairs, Arne Jacobsen became interested in this design and in the new material, and he decided to design a chair using the plywood.[59] Fritz Hansen got enrolled in the network and as machine engineer he needed to find the appropriate way of working with the plywood made of beech, the native timber in Denmark. The allies worked together to design the chair (named after the Ant) with the seat and the back made of single piece of moulded plywood. To press the double-curved seat in one piece, it was necessary to make it smaller around the transitional section between seat and back, by stabilising the transition by bending the wood in the third plain. This technical necessity resulted in an aesthetic achievement[60] and it gave the chair

[54]Thau et al. (2001)
[55]Raizman (2004)
[56]interview to Verner Panton, in Thau and Vindum (1975)
[57]Thau et al. (2001)
[58]interview with the former internal designer
[59]korte træk af en lang historien
[60]field note taken in the visit to the museum in Lillerød

its name: Ant. One of the advantages with the new construction was that it allowed a strong bending of the back support. To make the back oversight comfortable, the chair had curvature and Søren Hansen in an interview [61] declared that the result of the process of prototyping was complex, and only a small part of the work was done at the drawing table. Arne Jacobsen, his helpers, Søren and Fritz Hansen with the use of machines, modelled the almost finished chair in the most tight collaboration.[62] The chair had three legs made in metal with a plastic coding and rubber feet. They were connected right under the seat where a small plate was glued on so that the screws have something to be screwed in, and from here the legs were extended to the corners where they are supported by runner suspenders. The factory Fritz Hansen decided also to manufacture the legs of the chairs because

> *on a modern furniture factory one must be as good as handling metal as we are in handling tree. We would like to control the product sent in the market s little as possible of the work is to produced out of our domain.*[63]

Verner Panton, in a later interview, made some reflection on the development process and on the mobilisation of the Eames chair:

> *Another industrial chair production was launched by Fritz Hansen in 1952, it was the small laminated three legs chair designed by Arne Jacobsen and later called the Ant. The seat and the back are pressed in one piece out of 10 layers of plywood and afterwards the shell is tight to three thin metal legs. The Ant is a good example of industrial production of a high level of quality. (...)The Ant was created while I was working there [in the office of Arne Jacobsen], and I remember Arne Jacobsen acquired an Eames chair from Fritz Hansen, which caused a bit of trouble because the Ant was looking too much like it. Our cooperation was based strictly on the work itself. We worked across six or seven tables in the drafting room, everyone knew what went on everywhere. To put it rather candidly, it seems to me that his ideas were not very well developed before we actually got started, they would often amount to only a few lines on a piece of paper. But that was sufficient. Linguistically he was rather inarticulate.*

[61] Korte træk af en lang historie

[62] Søren Hansen in a interview, in Korte et lange historien

[63] Søren Hansen in a interview, Korte træk af en lang historie

> *His comments were short and to the point. He never did many sketches, but he experimented a lot with models.* [64]

Specifically by reducing the seat and back to a single continuouos element and with the shells curved in one direction, characteristics that made it stackable, the Ant was distanced from the Eames chair.[65] It was this problem with the transition between seat and back that Jacobsen solved by instead cutting into the shell from the outside and giving it a contour with a waist. The development work resulted in strengthening the shell by gluing two layers of linen between the plywood layers.[66] The glue used was the one already introduced for the AX chair.[67] Arne Jacobsen had an approach that was very open to any suggestion:

> *he worked intuitively. At the beginning of the project, he seemed to be searching and sensing, and with a clear lack of self- confidence. He was open to all the possibilities which were there at the start.*[68]

The Ant chair was introduced and described by the press during its inaugural exhibition in the Danish Museum as ideal working chair, since the back was shaped so that the spine had a natural support.[69] Its strong design allowed to a strong bend of the back support, and considered technically an accomplishment.[70] Bard Henningsen, designer in Fritz Hansen Company responsible for exhibiting the chairs, commented on the Ant and its launch:

> *You bet, and it was a good one! He was extremely knowledgeable about everything he did. The exhibitions he was in charge of, the presentation of the Ant at the Danish Museum of decorative art in 1952- It was absolutely marvellous (. . .). He had a remarkable gift for staging, and he was very conscious about it. He was not concerned with all the business consideration in connection with a presentation, only with the visual impact, and here he did not compromise*[71].

[64] interviews about Arne Jacobsen, Tau et Vindum, 1975
[65] korte træk af en lang historien
[66] bk_63; 86: Thau et al. (2001)
[67] cat_49a,b,c,d: Besøg os i Lillerød
[68] Teit in Thau and Vindum (1975)
[69] Dagens Nyheter 8/3/53: Hur dansken bor
[70] cat_49a,b,c,d: Besøg os i Lillerød
[71] Thau and Vindum (1975)

The press displaced the Ant as very innovative, low-cost and lightweight chair when it was presented in the market, and Søren Hansen in an interviewed admitted that he did not believe that the design process could be completed, since it was very difficult to work with such little thickness to create sufficient strengths in the transaction between the seat and the back, and they worked until to stabilise the transaction with a bend conjunction in the third plan.[72]

Spokespersons The identified spokespersons are Arne Jacobsen, Søren Hansen and Fritz Hansen. Arne Jacobsen spoke on behalf of his studio, he was a macro-actor and of the drawings for realising the chairs for the canteen of Novo Nordisk, he pushed the design to the limits by doing the chairs only in one piece (whereas the Eames'chairs were made of two pieces, the seat and the back rest). Søren Hansen and his brother supported and technically helped the design of the chairs without any constraint in terms of manufacturing: the manufacturing process should adapt to the idea of the architects, not vice-versa.[73] Fritz Hansen (machine engineer and manager of the production department) worked actively to find the appropriate machine and manufacturing technique to make the production of the Ant possible, adopting the machineries of the plywood to produce the beech plywood and model it, since the beech was the native timber in Denmark. Søren Hansen was speaking on behalf of the modern manufacturing production of industrial design.

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept and develop the plywood as material for the furniture industry.

[72]Korte træk af en lang historie

[73]cat_field note, informal talk with the employees in Allerød, working in the production

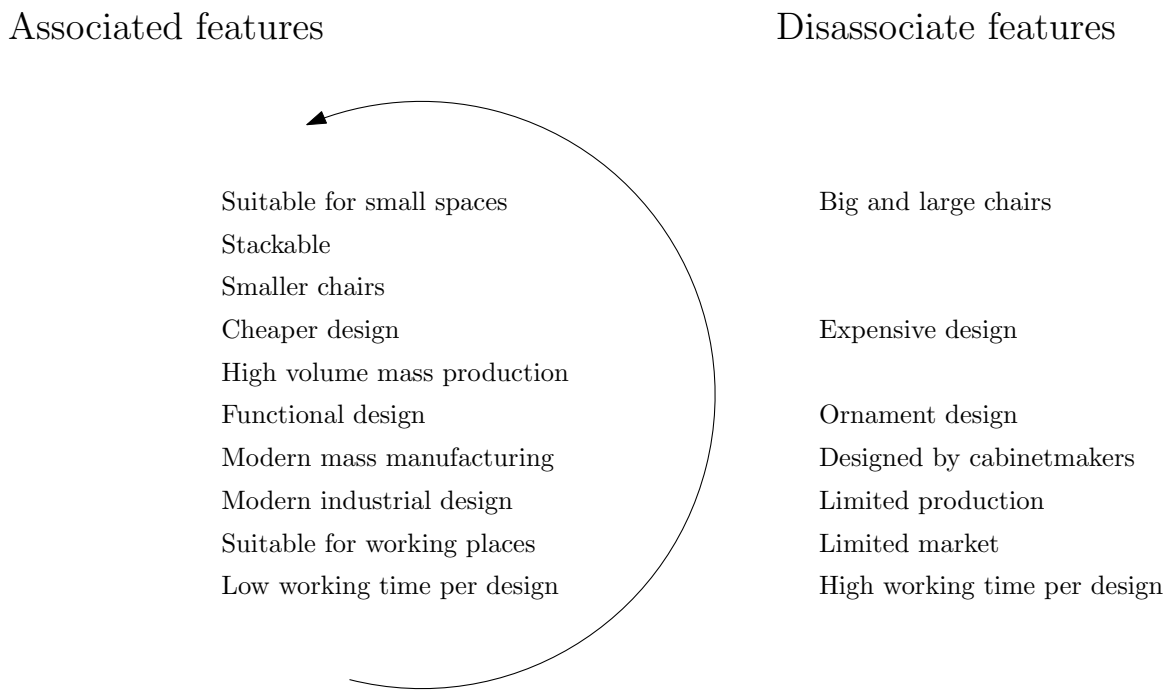

Figure 5.7. Design features as an outcome of choices, Ant episode. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of adopting the Ant as new design chair.

The spokespersons worked for and promoted the features of the plywood being flexible for the industrial production, allowing high volume mass production, and decreasing the price per item, so the design became suitable for the mass market. The technique for steam bending the wood and producing chairs was largely used by Thonet and refined by Aalto, and it was used by Fritz Hansen before the introduction of the plywood. It became very costly to produce, since it was not a technique suitable for industrial mass production, but it required consistent amount of man-hours; with the increase of wages, it became unsustainable. After the war, the economy of Denmark was flourishing; according to the economic reports,[74] the wages were increasing, there was higher power of purchase for the consumers, the factories were increasing their production capabilities and their export. Even if Denmark had not been heavily damaged by the war, the housing and the construction industry was considerably developing, building many new flats, private houses, and industrial sites. Therefore, Danes were willing to buy new and modern furniture with new and modern houses, and the steam bent furniture industry could not satisfy this requests.
Søren Hansen had the possibility to invest in new machinery because Fritz Hansen was one of the few Danish companies in a competitive position:

[74]statistical reports from the '50s

after some severe winters during the war, there was a widespread destruction of Danish walnut tree, the most popular tree among cabinetmakers. Fritz Hansen was among the few manufactures who bought enough walnut tree immediately before the blight, so it could continue the production at a lower cost compared the competitors, and gained enough revenues for making investments in the 1950s on new furniture.[75] Moreover, Fritz Hansen Company was among the first one to change the kind of timber used in the furniture: beech instead of walnut (Morgens Lassen's chair); the beech was Denmark's most common native tree, but its timber was not considered good for making furniture.[76] Morgens Lassen developed a new technique in Fritz Hansen in order to make the beech resistant during the bending process.[77] Arne Jacobsen, using the technology developed by Morgen Lassen for working the beech, decided to use this material for the veneer.[78]
Fritz Hansen (fabric director) was manager together with his brother, Søren Hansen. He was in charge of the production system. He had studied industrial production and engineering, and his main focus was the management of machineries and finding new ways for producing furniture at a lower price; he was assisted by Axel Petersen,[79] responsible for the maintenance of the machines.
The spokespersons worked for associating those qualities to the Ant, and disassociate the one that were supported by the cabinetmaker production, which were traditional and only for a limited market and function: the chairs were intended to be used only in one context and could not be translated into other environments (for example, a dining chair could not be used in a factory).

5.2.1.3 1953-1955: Third sub-episode: the design of the Serie7

Allies in the network The following table represents the allies in the network that supported the development of the Serie7 chair, "designed" by Arne Jacobsen, made of plywood and manufactured by Fritz Hansen.

[75]Segerstad (1969)
[76]cat_26: Ekstra Bladet, 5/2/64: smukt go billigt
[77]cat_26: Ekstra Bladet det, 5/2/64: smukt go billigt
[78]cat_16: Hobro Dagblad, december 1963: møbler som vi ikke have drømt om for ti war siden
[79]minutes from the meetings

Ant chairs	Arne Jacobsen	Axel Pedersen	Beech plywood
Copenhagen	Complaining customers	Danish bourgeoisie	DAN chair
Danish welfare state	Danish Architect Association	Different plywood for external layers	Ergonomic seats
Economic growth	Fritz Hansen company	Fritz Hansen	Henning Simony
Industrial production	Museum of applied arts in Copenhagen	New factory	New buildings (private and industrial)
Newspaper articles	**Organic design**	**Plywood**	Prototype
Wood colours	Tubular metal legs	Steel screw	Shock proof rubber feet
Smiths	H55	Søren Hansen	4 legs and 2 armrests

Table 5.3. Allies and black boxes in the network of the Serie7 chair. The allies in the network in blue are human allies, the red ones are non human allies and the black one is a black box.

Translations, mobilisation, enrolment The following figure represents the translation process from the ANT by the complaining customers about the ANT that lead to the development of the Serie7

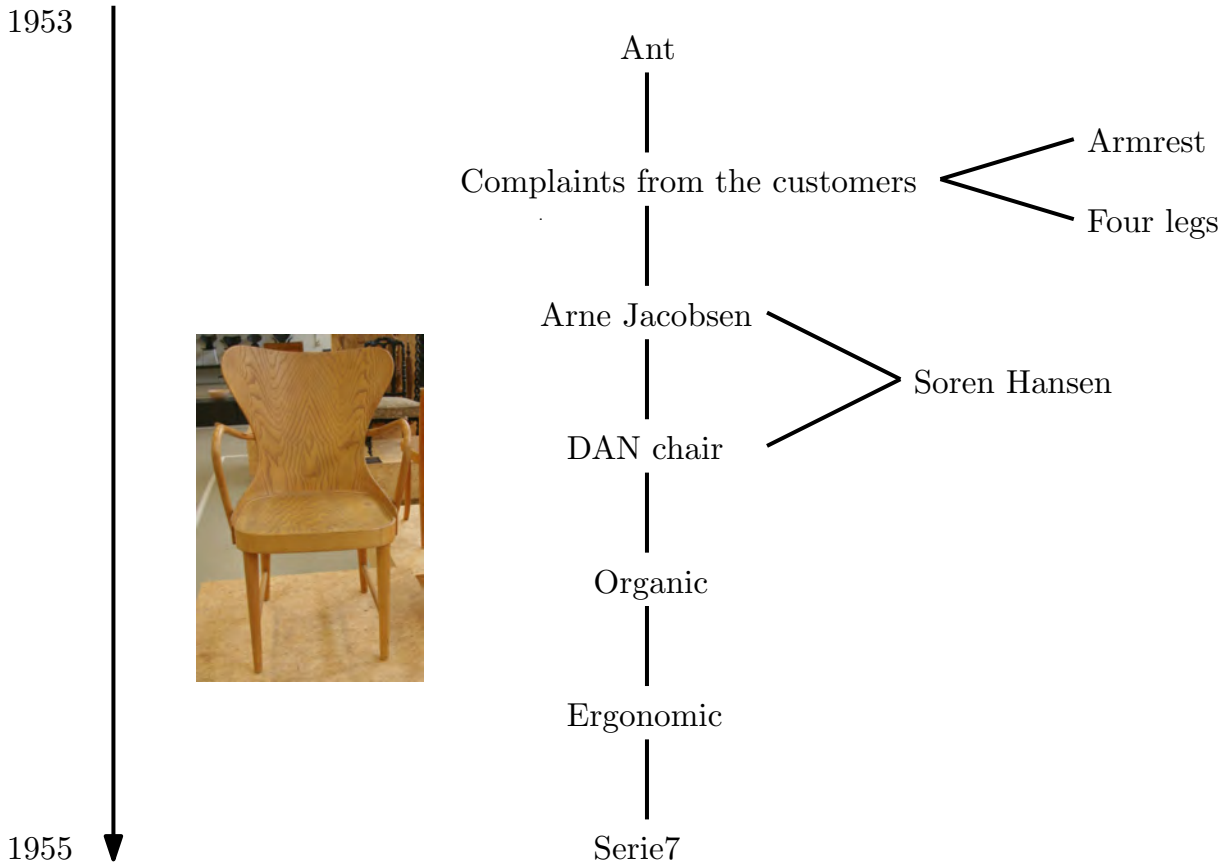

Figure 5.8. Translations, Serie7 episode. Overview of translations that the Ant went through to be translated into the Serie7.

The Ant was presented as receiving very positive and enthusiastic reviews in the newspapers and by Danish architects. The customers and Henning Simony, however, were not satisfied with the three legs and the lack of armrest: they wanted to have the same chair with four legs and armrest.[80] Arne Jacobsen refused to add the four legs and the armrest (*Why should have 4 when 3 are enough?* affirmed Arne Jacobsen in an interview):[81]adding the armrests to the Ant meant to compromise the design (the backrest would have changed to support the weight of the armrests):[82]

> *Journalist: People can say that is a very unconventional chair, raffinate, international, that is speaking very different idioms (. . .). Arne Jacobsen:"What is Danish and what is international, can you even put such names in contemporary art? At least I did not think it when I work with that. I started from the need: which chair is used for? I have found, that men needed a new chair for*

[80]interview with the former internal designer
[81]cat_425: Information, 9.2.53: hvofor skal en stol have fire ben?
[82]Field Journal

the small kitchen and tables, since nowadays there are many new buildings, and the need to buy smaller and cheaper chairs. At the same time I have also used in the canteen the stacking chairs. They can be stacked shoots popping into each other, thereby saving both time and effort".
J:"How do you do a chair?
AJ"I begin therefore with a loose sketch, like the one I have made for Fritz Hansen with the propose of collaboration. It was necessary to have an intimate collaboration between architect and the firm for having a good result.
Fritz Hansen was interested in trying to do a new chair, as you know it from the model here.
In the old days it was relatively easier to design a chair, because the shape was like the other chairs. My chair is made of pressed veneer, it is tridimensional in its shape. Therefore it is innovative design. I think we made so many variation before the chair was put in the production, just because we work together, we could bring in the production process and thus the cost, could stay at the minimum. Before it took one day to make a chair, now 10 minutes. And this is also because of its shape."
"Is the shape the definitive?"
"With the material that I have on my hands, it can not be different, I have pushed the tree elasticity until the boundaries."(...) [83]

Jacobsen was defending the fact that a chair with three legs did not have any problem of stability, since it always touched the floor. A design critic in 1953 commented:

This is definitely a piece of utility ware that clearly satisfied the manufacturer's demand, largely also the user's, and was even designed as a living ornament in its own right. The aesthetic value of an ornament that repeats itself was exploited here, ingeniously benefiting from the fact the the chair frequently appear in groups and stacking chairs most often as an entire legion. Jacobsen used this quality, which he had already exploited for the bellevue theatre on several occasions for exhibitions. Once he used it in another direction, stacking 11 chairs, creating not only an ornamental but also a sculptural effect.[84]

[83] cat_425: hvofor skal en stol have fire ben?
[84] bk_63; 86:Thau et al. (2001)

In 1955, Arne Jacobsen, together with Søren Hansen and Fritz Hansen, taking in account the critics and the features of the Ant, decided to translate them into a new chair, the Serie7, to enroll the dissident customers in the company's network. The translation was successful by inscribing the qualities of ergonomic (promoted by Saarinen[85] and taught at the university by Kaare Klint[86]), organic (black boxed since the first sub-episode), functional,[87]and the shape of the DAN chair in a more harmonious shape using the new production technique,[88]designing it with four legs and armrest, suitable for the living room.[89] The DAN chair was designed by Søren Hansen and manufactured by Fritz Hansen in 1949. Søren Hansen went to Canada before the start of the Second World War, and he[90]saw a chair that he liked, but he could not buy. He went back to Denmark with a drawing of a chair, but it was lost. So Søren Hansen re-drew from his memory, added what he thought was better to add, and he took away what he thought was redundant.[91]The resultant chair was with high back and high armchair. The DAN chair was produced until 1950.[92] The technique for building this chair was similar to the one used to construct the Thonet chairs since 1934.[93] The process for designing the new chair was much unarticulated, based on prototype:

> *it was always minute sketches, the size of a napkin, and then we were to make it and he would like to see a model in a week! And there was hardly ever to much for writing or that sort of thing.*[94]

The modifications were made on the prototypes, not on the drawing table:

> *the craftsmen would often joke about him because he was so difficult to work with. Once we were working on a chair which was to be reproduced about 50 km from the drafting office in Klampenborg, and that meant that when he had new suggestions, some*

[85]Fiell and Fiell (2013)

[86]catalogue exhibition of danish chairs

[87]interview with steen, cat_593: Aktuelt, 11; 11/2/1962: Kultivatoren

[88]mus_26: museum in Allereød

[89]bk_63: Thau et al. (2001)

[90]bk_catalogue and history of the chairs manufactured by Fritz Hansen during the years, written by the former designers in Fritz Hansen

[91]bk_catalogue and history of the chairs manufactured by Fritz Hansen during the years, written by the former designers in Fritz Hansen

[92]bk_124: catalogue and history of the chairs manufactured by Fritz Hansen during the years, written by the former designers in Fritz Hansen

[93]bk_101; 111; 122: catalogue and history of the chairs manufactured by Fritz Hansen during the years, written by the former designers in Fritz Hansen

[94]Ove Hansen in Thau and Vindum (1975)

workers came to fetch the chair and returned to the next morning, changed. Several times, the changes were so small that we could not draw them onto the model and instead we drew a line, from there to there a little bit had to be taken off, but it was often less than the breadth of the line. Those who worked on the actual chair returned to the drafting room looking deadly serious. Some years later I met the foremen, who had dealt with that specific chair. He told me that they drove the chair to the factory, erased the line and brought back exactly the same chair.[95]

In an interview, Jacobsen mobilised his goals for the design of the chair:

anyone who has been involved with building housing knows that foliage has gotten smaller and smaller. Furniture consequently also has to take up less space. I have made my chairs so that they can be stacked and leave the floor open. This is very important in private homes, and imagine what it means in a lecture hall. This chair took me a year to make before I dared to let it out. A large and costly apparatus is put in motion when a chair is to be manufactured serially. I myself stood and moulded it to achieve the right curves, which are decisive for the seating position. We cannot see the cut, but we do feel it is right if we rest in it. Then we can make the chair's appearance correspond to out view of what looks good.[96]

The Serie7 could be bought in different kind of wood (the external layers of the chair could be of beech, teak, rosewood, walnut, or oak) and different colours (black, red, blue, white, curry, dark green, or blue) with steal legs either covered with corrugated plastic or frosted; Fritz Hansen was also offering tables that were matching the chairs in terms of design.[97] The chairs were presented at the H55 to the public for the first time at the exhibition in Helsinborg; the 3201 (armrest) were exposed at the Danish pavilion designed by Jacobsen, while the 3107 (chairs without an armrest) were inserted into the pavilion *Danish apartment* designed and furnished by Finn Juhl.[98]Bård Henriksen described the exhibition where the Serie7 was presented

he had a remarkable gift for staging, and he was very conscious about it. He was not concerned with all the business consideration

[95]Verner Panton in: Thau and Vindum (1975)
[96]Interview of Arne Jacobsen in Thau and Vindum (1975)
[97]cat_431: article of 1955, FH
[98]bk_63: Thau et al. (2001)

> *in connection with a presentation, only with the visual impact, and here he did not compromise. I still remember the showing of Serie7 at the exhibition H55 in Helsingborg where Arne Jacobsen was in charge of Danish pavilion. It was magnificent. There is naturally always something to be learned from such an experience and I learned an incredible amount (...). When first produced, it [the Serie7] seems very sophisticated, but it is in a certain sense undated (...) At the factory one could see that this was something special, one believed in it- and it was a success from the very start, even though it is rumoured otherwise. Instantly it was exhibited worldwide, and was given a separate room at the annual exhibition of Danish design. This chair was new, simple and expressive. It was small and modest and at the same time it expressed so much.*[99]

Danish design emerged as an actor since the introduction of this chair in the market.

Spokespersons The spokespersons for this period were Søren Hansen, speaking on behalf of the company and of the customers, and Arne Jacobsen was a macro-actor defending the Ant chair and translating the complaints of the customers into a new chair.

Features associated and dissociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept, adopt and buy the Serie7.

[99] Bard Henriksen in Thau and Vindum (1975)

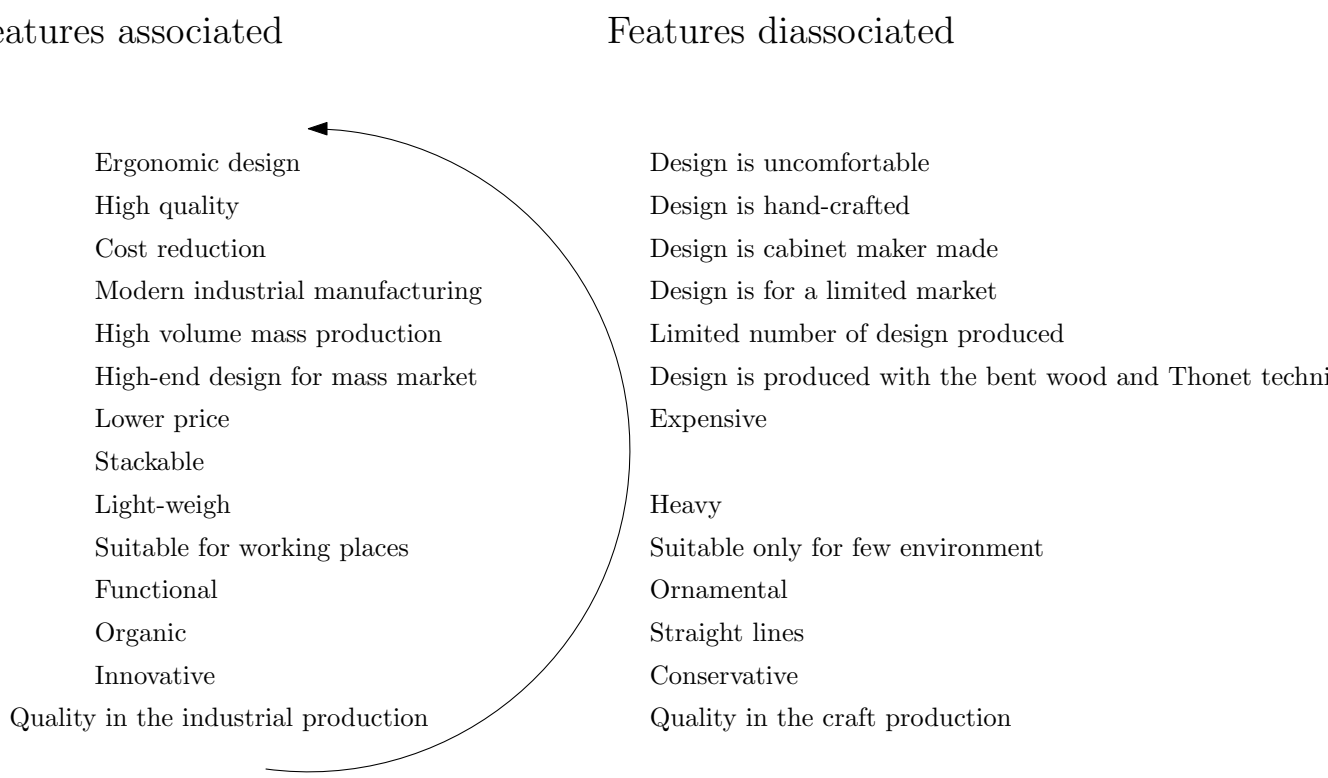

Figure 5.9. Design features as an outcome of choices. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of adopting the Serie7.

Fritz Hansen had a stable and sustainable business, with offices in Copenhagen and New York. It was among the first companies in Denmark to work with architects and not only with cabinet makers.[100][101] Søren Hansen, as spokesperson of Fritz Hansen Company, worked for supporting this position of the company, agreeing to collaborate with Arne Jacobsen for the development of the Serie7, without compromising the design of the Ant; both spokespersons agreed to work with the technology developed for the Ant, not using the steam bent wood or other cabinetmaker technologies. In 1954, Fritz Hansen opened a new factory in Copenhagen, for the purpose of expanding the production of the plywood chair (teak, beech, or black).[102] Another new modern manufacturing production site was opened in Allerød, to increase the productive capacity. This allowed to have more chairs in the portfolio of offers. The Serie7, thanks to the modernisation of the factory in 1954 due to the conversion of the production from bent wood to gluing

[100] information from the balance sheets, the minutes from the meetings in the 1950s

[101] bk_107, catalogue and history of the chairs manufactured by Fritz Hansen during the years, written by the former designers in Fritz Hansen

[102] FH 17-1-2012_0004 copy

and pressing layers of laminated plywood, was very fast to produce. All in all it took less than one hour to produce a chair: less than one minute to cut the plywood to cut in the right shape; 3 minutes to press the plywood and it went the whole way until the chair is ready to be distributed.[103] Fritz Hansen as manager of the production did not oppose resistance or created struggles to the new industrial technology, but he worked actively for finding or building the machinery necessary to work with the plywood and expand the industrialisation process, finding solutions for the moulding process for pressing the different layers of veneer. The spokespersons worked to enrol the workers of the factory to agree with the goals of the new technology, explaining that they would not loose their job, their tasks would be more simple, more efficient and of higher quality,[104] and new jobs would be created.
In an interview for the newspaper Politiken, about the industrial production and the design process, Søren Hansen affirmed:

> *Machines fail to rule designs of Denmark. Fritz Hansen eftfl (which stands for Fritz Hansen successors) is considered not only Denmark' s but all of Scandinavia' s largest and best furniture factory. This means something in Scandinavia, where furniture design, like most other industrial arts, is of a very high standard. Two sons have the management, and their object is to manufacture good and well designed furniture. Some of the models they design themselves, others are done by well known architects. Their furniture is not cheap, but well made and well designed, so that is generally accepted a well worth its price. They are especially known for their excellent chairs. The factory employs 350 men, and has grown gradually through three generations. Not only artistically but also technically, the factory has done a pioneering job and several stages of the manufacturing process are built on inventions and pieces of machinery that have been experimented with in the factory itself. Everywhere one meets practical and effective arrangements which rationalise the manufacturing process. "But, says Søren Hansen, we rationalise, there is always a limit. If the work gets to be too monotonous, the workman loses interest, and in the long run the quality of the workmanship will suffer. One cannot manufacture good furniture with indifferent people. Each department has its own foreman, 35 all. There is*

[103] cat_61; møbel- kultur9/64
[104] minutes from the meetings

hardly a pice of modern equipment that is not there, but in spite of this, the finishing process is done by hand, and plays an important part".
"One cannot help asking if this principle does not make this furniture very expensive".
"Expensive, yes, sometimes three times as expensive as Swedish furniture. But we feel that it is important that a chair, a piece of furniture does not only fill its function, but also is aesthetic. We want to point out especially that we do not design our models for the machines, but let the machines execute the type of furniture we want as economically as practically as possible. If one designed the furniture to fit the machines, it must unavoidably lead to a worshipping of the machine which consequently must push the aesthetic motives into the background. We don't manufacture any furniture we don't like ourselves, and it is thought for people. We will never fear to be inferior as long as our product is superior. If necessary, we must leave it to others to become big."
"Design Rules?"
"In watching the different stages of the manufacturing process one cannot help noticing that is certain details in a design had been changed, the machine could have done the necessary work more quickly."
"Would it not have been more practical, more rational, if the designing architect had acquainted himself a little more with machine production? It must be possible to save some time through a more simplified and more logical shaping".
Seriously and convincingly Søren Hansen replies "but there is a designer's logic to the machine's capacity. We cannot tell a designer- our machines work in such and such a way, design the chair accordingly. I have to tell him- let your artistic sense design the shape as you feel it ought to be. My job as a technical expert is to work out as simple and as economical a process my machines allow me. Your ability as an artist is more valuable than my machine. It can, of course, happen that a certain design cannot be made by machine, but has to be made by a cabinet maker, but that does not mean that the design is less good, only we have not the possibilities to execute it. My father and my brother and myself cannot take the responsibility that our technical knowledge should

become tasty and sense of beauty.".[105]

Fritz Hansen was associating to the features that concerned the high volume of mass production to increase the profits by reducing effort per hour per chair, decreasing the production cost and the sale price, so the number of items sold could increase, without impairing the quality, and the customers were aware that the quality of chairs produced by the company was elevated and constant. An article, written by Fridolin, a journalist of Politiken[106] described the past of Fritz Hansen as very good quality furniture manufacturer.

> *18 years ago I was drifting around in Copenhagen from one end of town to another. I was getting married and I needed furniture. Back then, I had no idea that among furniture, the most important is the armchair. Nowadays I even feel the workbench knows it. But still I would not enter marriage without armchairs, of I had given myself the idea that I wanted the best ones in Denmark. And I was presented two armchairs as big and thick as elephants, armchairs with curlicues, and armchairs with tassels, frills, and upholstery so fast as trains. And they were expensive: three, four, yes even six hundred [Danish] kroner which is the same as six, eight and twelve hundred kroner today.*
> *But then a wise cabinet maker whispered in my ear: "buy a Fritz Hansen chair!"*
> *Fritz Hansen, I said unknowingly... What is that?*
> *"Oh, the cabinet maker said, don't you know? It is as fine as the factory of Royal Porcelain and silver of Georg Jensen."*
> *"Damn the nice look, I said... I want two armchairs: one for me and one for my wife. They have to be like a dream to sit in, and they have to last for a hundred years, and they have to be cheap."*
> *"That's exactly it, said the cabinet maker. The only chair that can fulfil all those requirements is a Fritz Hansen chair."*
> *So I bought two of those. And do you know what, dear reader? One costed 85 kroner, and the other 110 kroner, and they have served me with loyalty for the past 18 years. (...) In 1872 when Georg Brandes and the naturalism changed Denmark, the cabinet maker Fritz Hansen started a workshop with two workbenches in Hindegade. In 1889 a steam engine and Fritz Hansen's son Christian E. Hansen was added, and then things really started.*

[105] cat_415: Machines fail to rule Design of Denmark, by Frances Van Hall (1956), newspaper article found in the warehouse of Fritz Hansen

[106] cat_429: Social Demokaten: Tre stole ønsjer seres ophav pænt tip lykke;

It evolved into an engine driven workshop in Christianshavn and a sawmill in Lillerød, and they produced chairs with tassels and curlicues in a great speed - For Christansborg castle, for the yacht of Zar Alexander and for the theatre called Scala of Frede Skaarup and many other famous buildings.
(...) In 1925 the functionalism entered Europe. It started in Paris and the Fritz Hansen company followed immediately and got the best designers working for them: - Frits Schlengel, Kaj Gottlob, M. L. Stephensen, Viggo Sten Møller, Arne Jacobsen, Kaare Klint and Mogens Lassen. The company made all the Danish breakthrough in Danish furniture design, and today it is designers like Arne Jacobsen, Hans J. Wegner, Peter Hvidt, Molgaard Nielsen and Poul Kjærholm that maintain the high quality and fame under the supervision of the two grandsons of Fritz Hansen, Fritz and Søren Hansen. The last is better known as the leader of the Danish union of handicraft.
(...) But the company of Fritz Hansen is also always before its time, so it will fit great together.

Arne Jacobsen was aware of the framing power of the press for building a strong network sustaining his designs, and "*he did not draw a single line without informing the press*".[107] Arne Jacobsen attached and worked to promote the qualities of being stackable, lightweight, of good quality, and organic. The Serie7 was also designed thinking about the needs of the Danish families, since the buildings and the flats were getting smaller, so there was the need for smaller and stackable furniture.[108] The Serie7 maintained the qualities of the Ant in terms of quality, good seating, novelty, organic design (by some journalists, more organic than the Ant)[109], innovative, beautiful,[110] but with armrests and four legs, sold for a good price.[111] According to the press, the chairs designed by Fritz Hansen were able to provoke a good feeling in the viewers that were looking at it.[112]
Søren Hansen was valuing the qualities of industrial production and that the technology used was not a cabinetmaker technology; a new industrial process-based alternative to the Thonet method that became too expensive

[107]Thau and Vindum (1975)

[108]cat_193: House and Garden; 1953; 116Information 1953: Hvorfor skal en stop have fire bent; : still 1965; 117,schooner wohner, okt 65;

[109]et lange historien

[110]cat_26: smukt go billigt; ekstrabladet 5/2/64

[111]cat_111: Alt for Damerne 10/5/66 Af arkitekt steen Østergaard;

[112]cat_418, Mobel vatleden n 3, 1957; 425: Goda Former, 1957; 193: Hvofor skal en stop have fire ben? Good morning Room; 1952;

since the chairs were hand-made.
Additionally, he was promoting the features of cost saving, innovative, working chair but also a chair ideal for families.[113]He was also acting against some features: the chairs were not done with the bent wood technique, they were not handcrafted, they were not of cabinetmaker design, and they were not traditional chairs.
Fritz Hansen framed the chair by mobilising the values of quality and industrial production by supervising the industrial process and making it possible. The press described the Serie7 as a quality product, beautiful, organic and comfortable working chair,[114] and as feeling good, beautiful, for families.[115] The press was also mobilising the other chairs presented in the market and comparing with the Serie7, arguing that the Serie7 was among the most organic and innovative chairs in Denmark.

5.2.2 Conclusions on the first episode

The first episode is divided into three sub-episodes. In the first one, the plywood as new material for the modern manufacture industry is developed. It was translated from being something hand-crafted, difficult to bend, to a material suitable for industrial production. In the second one, the Ant chair is designed and manufactured, and because of the complaints of the customers, a new chair, the Serie7, was created made of plywood. The plywood was developed in Finland (Alvar Aalto was Finnish), displaced in USA, and then brought to Denmark by Søren Hansen. It was mobilised and presented to Arne Jacobsen by enrolling the Eames Chairs. Søren Hansen and Fritz Hansen worked on the machineries to improve the flexibility of the wood and made it possible to bend to the point of making a chair in a single piece. Fritz Hansen, responsible for the machinery, found a way to adopt and adapt the material to the local needs, uses and native timbers. The plywood was used by Arne Jacobsen and the Hansens to create the Ant chair, but the clients complained because of the lack of armrests and for having only three legs instead of four. Therefore, the Ant chair was mobilised, and by translating the complaints and the DAN chair, the Serie7 was created. The designer was not only Arne Jacobsen, but a heterogeneous network of allies that took part at the design process. Arne Jacobsen was the macro-actor representing them.

[113]cat_116; still, 1965: de meeste verkochte stoel
[114]cat_61: B.T. 24/10/1963: mindst en stol i minuttet- go det er verdens mest solgte
[115]from different articles collected in the warehouse written in 1955

5.2.3 Episode 2: The Long Introduction of the Serie7 in the Market (1955-1975)

The analysis of this episode is focused on the periods following the introduction of the Serie7 at the H55, the exhibition in Helsingør in 1955. This figure displays the enrolment process that happened in a period of 20 years (circa). In this network, some of the actors emerged in the previous episode are black boxed, some are leaky black boxes (because the actors struggled to close totally), some actors have left the network, and others been enrolled in the network.

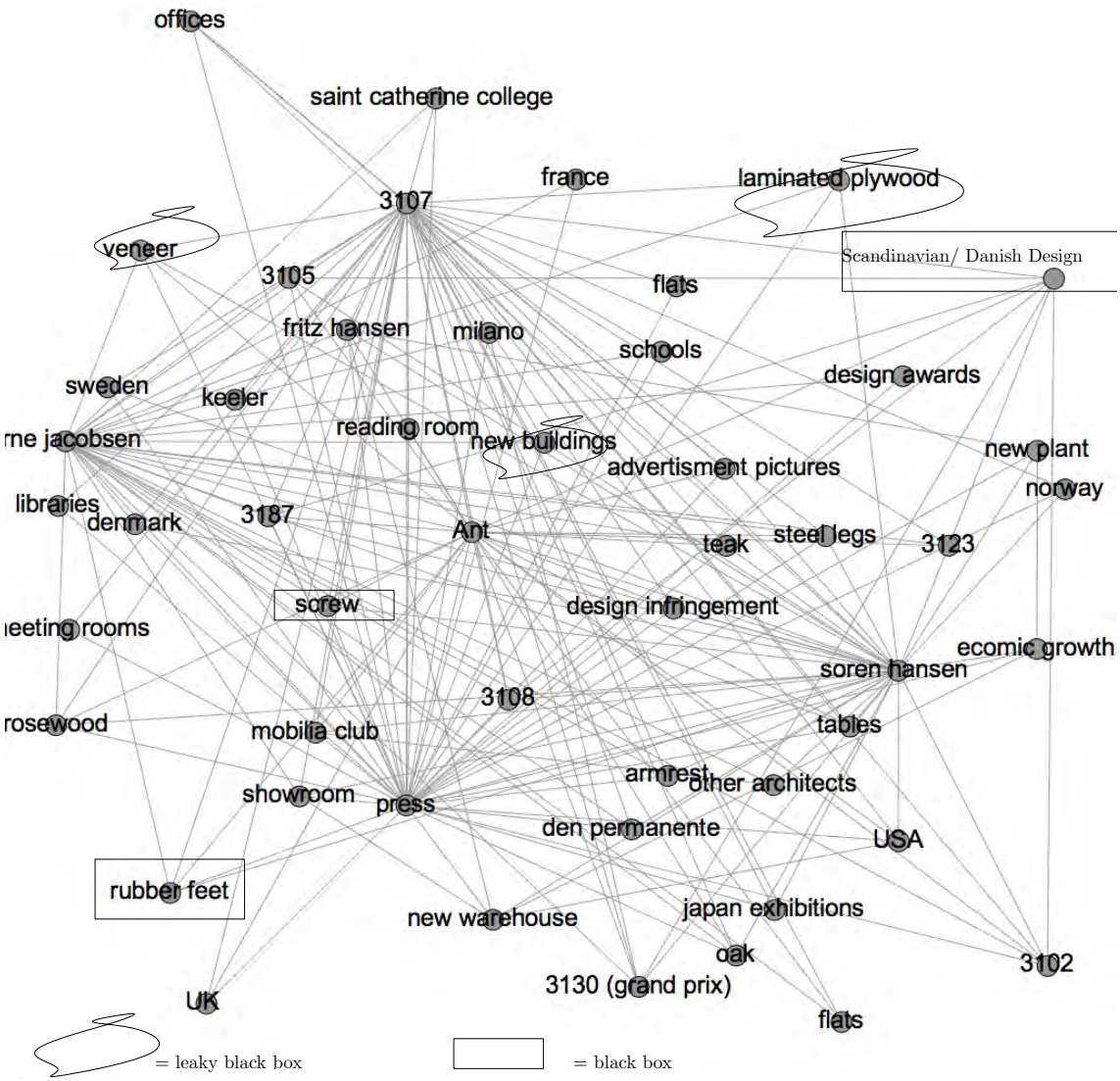

Figure 5.10. Allies in the network, second episode. Network showing the allies enrolled and their relationships in the period following the introduction of the Serie7 in the market, covering a period of 20 years.

Allies in the network The following table represents the allies in the network that supported the introduction of the Serie7.

Advertisment pictures	Ant Chair	Architects associations	Arne Jacobsen
Armrests	*Colours by Arne Jacobsen*	Den Permanente	Denmark
Design awards	**Danish Design**	Danish krona	Design Exhibition
Design infringement	Different woods for the external and internal layers of the plywood	Economy	Economic growth
Exchange rate	Flats	France	Fritz Hansen Company
Japan exhibition	Keeler	*Laminated plywood*	Libraries
Meeting rooms	Milano (Triennale)	Mobilia Club	*New buildings*
New plant	Newspaper articles	New warehouses	Norway
Offices	**Organic design**	Other woods for the external part	Press articles
Rubber feet	Saint Catherine College	Schools	**screws**
Showrooms	Søren Hansen	Tubular metal legs	Sweeden
Tables	UK	USA	All the machines use for producing the chairs
Veneer	3102	3105	3107
3108	3123	3187	3130

Table 5.4. Allies and black boxes in the network of the Serie7 chair during the introduction episode. The allies in the network in blue are human allies, the red ones are non human allies, the black one is a black box, the ones in italics are the leaky black boxes.

Translations, mobilisation, enrolment

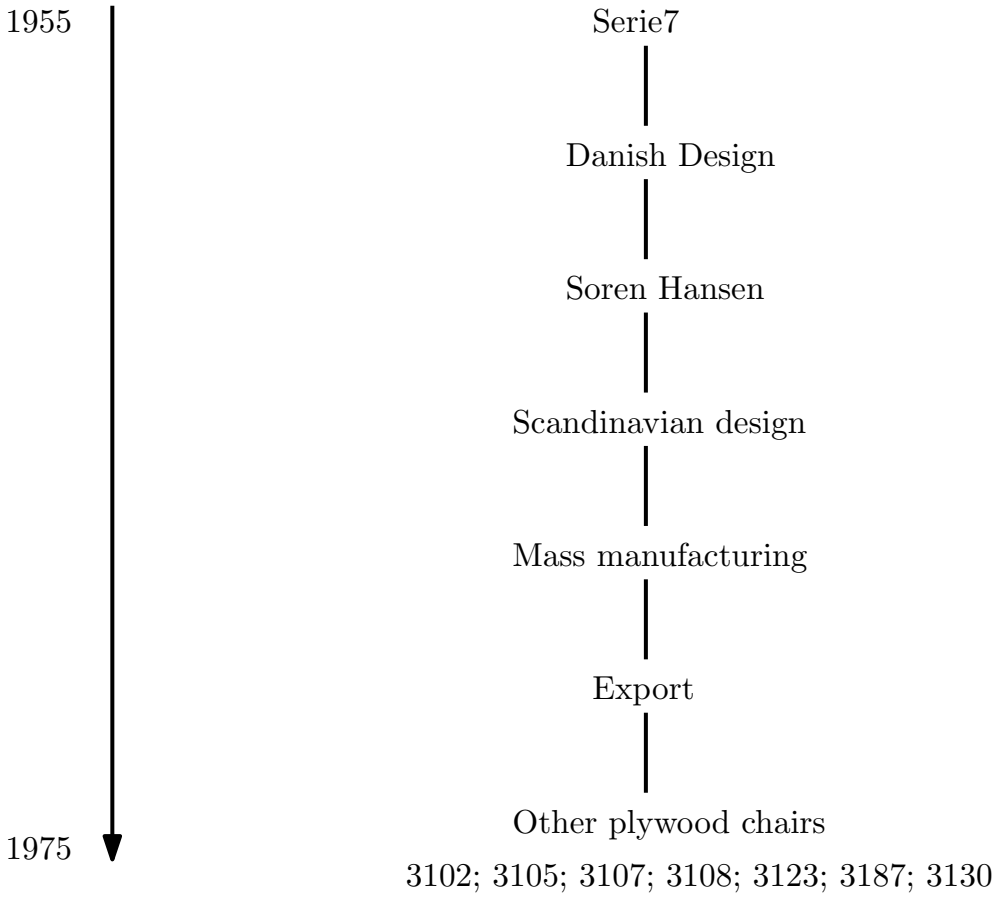

Figure 5.11. Translations, second episode. Overview of translations that the Serie7 went through to be displaced as a modern plywood chair, which could be translated into other plywood chairs.

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After the introduction of the Serie7, Fritz Hansen's management intended to exploit the production capacity and increase the market share; the best seller in this period was the Ant, which constituted until 1965 the 40% of the income of Fritz Hansen, then it started to decrease and in 1975 the

production of the Serie7 increased considerably.[116] Until that moment, the two chairs were advertised together. The allies in this network were supporting the goal of being favourable to break with the past, to change the architectural and design language. The Serie7 chairs, after the presentation at the exhibition H55, were displaced in different exhibitions and presented to the public and other companies. Søren Hansen and Arne Jacobsen were almost always present and were communicating the qualities that the chairs were attaching. At the beginning of this network formation, the chairs were represented in pictures in small flats, suitable for small buildings, but also in large canteen, meeting rooms, and municipality rooms.[117] Arne Jacobsen intended to experiment with the design and to build chairs that were suitable for his buildings; due to the favourable economic situation, people from the middle class could afford to ask for loans and commission the project of their houses to Arne Jacobsen, who inscribed in this houses and villas the actor White Danish Modernism, a translation from the modernism of Le Corbousier and Mies van de Rohe. The houses were also furnished with furniture designed by Jacobsen, some of the buildings used to advertise and displace the Serie7 and the Ant were: Rækkehusene Søholm II (Bellevuekrogen 2-18, Klampenborg, 1949-57), Rækkehusene Søholm III (Bellevuwkrogen 1-7, Klampenborg, 1953-54), Allehusene Jægersborg (all numbers from 185-229, Gentofte, 1949-1953), Gertie Wandels Hus (Prins Axelsvej 13, Gentofte, 1961), Munkegårdsskolen (Vangedevej 178, Søborg, 1957, building that made the Master of Oxford deciding about hiring Arne Jacobsen for the design of the St. Catherine' s College), Rødovre Town Hall designed with Flemming Lassen and furnished with the 3107 and 3207.[118] In UK, Arne Jacobsen designed the Saint Catherine College, built among the ancient colleges of Oxford. Oxford and Cambridge were described by the British press as the oldest universities, [119] with architectural amalgams of virtually every style from 13th century Romanesque through Gothic and Tudor to Victorian. Oxbridge decided to refresh the style of the buildings, therefore St Catharine's master, Historian Alan Bullock, hired Jacobsen because he was not affected by Oxford's "*almost suffocating feeling of being unable to escape from the past*".[120] Jacobsen designed the college and dabbled with the interiors: he designed everything from the college silverware and chine to

[116]Field Journal, January 2012; information found in the warehouse of Allerød

[117]material and pictures collected in the museum in Allerød, field work journal

[118]information in the book for celebrating the centenary of Gentofte Kommune, found in the Frederiksberg Library

[119]cat_82: Time magazine, art section; the date is not written

[120]cat_82: Time magazine, art section

door handles, and the rooms had the Serie7 or the Ant .[121] For the canteen, the Oxford chair was designed.
In the late 1950s, the Danish furniture industry was having an increase in the export, making the production grow. The export of Fritz Hansen counted for the 55% of the whole production; the first export country was West Germany, where chairs were sold for an average of 7.267.000 kr, followed by USA with 7.176.000 kr, then France with 4.137.000 kr, and Great Britain with 3,5 million kk[122]per year. Danish Design became a black box, because the Danish furniture began increasing the extent of gaining around the world, its quality and components taken for granted. The USA market was interested as: a) Søren Hansen opened a showroom in New York in collaboration with Unika;[123] b) Søren Hansen was going to this city quite often (it seems at least a couple of times per year)[124] to promote the furniture, c)he actively engaged the New York customers by giving speeches in the high society circles about Danish Design and the quality that his furniture had; [125] d) Morgens Kock, Arne Jacobsen's teacher and assistant of Klint, organised the travelling exhibition in 1960 in USA about arts and design in Denmark. Arne Jacobsen, as discussed in one of the interviews presented in the previous episode, did not believe in the fact that design and furniture were peculiar objects, readable, and understandable in only one context or one network, but they could be, as immutable mobiles, mobilised and cognisable in different networks; therefore, the presentations were cured in the same way throughout all the world.

Important actors contributing in building up a strong network for the chairs were the exhibitions; both national and international. The exhibitions were the places where the furniture could be exposed, and every year, the Danish manufacturers were organising many in Denmark (Den Permanente, Fredericia), then most of them were travelling around Europe; for example, in West Germany there was an exhibition were not less than 75 Danish furniture manufactures were present.[126]
At the national level, Den Permanente was one of the most important exhibitions in Denmark according to the journalists that every year were reviewing it.[127] It was an annual meeting where architects and manufacture companies were showing the latest achievements in terms of furniture and commenting

[121]cat_83
[122]cat_125: Mændene bag stolene, review on a unknown magazine, museum in Allerød
[123]cat_175; 176; 177: Møbel-industrien, må kridte skoene
[124]minutes from the meetings
[125]cat_22: Danske Møbler i amerikanske hjem
[126]cat_42: Brugskunst og luftkasteller, Politiken 26/5/64
[127]cat_42:Telt-møbler, B.T. 26/5/64

them; but also a moment for vivid protests and debates on the furniture industry. It was a way to strengthen the relationships among the actors and for framing the customers on the qualities of design, and to discuss with other architects about the latest achievements and technological changes.[128] Bella Centre hosted the WTO conference, and the chairs for the participants were Serie7 chairs.[129] The persons participating were satisfied with the comfort of the chairs. After the conference, the CEO Lassen (son-in-law of Fritz Hansen, became manager after the brothers resigned in 1970 for age limit) in an interview declared:

> *we participated in many in the furniture fair in Bella Centre and we can be happy about a larger sale than last year. All in all we can be positive about the sales for the period to come.*[130]

After this exhibition, the sales in USA increased.
Mobilia club was an event where the companies were going to present and launch new furnitures in the market. The biggest European exhibition of furniture was in Koln, held every year on the last week of January. The exhibition area included more or less 400,000 square meters, and the Danish stands were the one with the largest area. The Danish pavilion was also providing the visitors with information on Danish houses and Danish environment. It was estimated that this exhibition could generate in West Germany for about 40 million kr for the Danish furniture industry,[131] interesting German and overseas customers.
Internationally, the exhibitions were organised in collaboration with the Danish embassy in the hosting countries, which organised press conferences to connect the manufacturers with the local press.[132]
Another import exhibition was the Milano Triennale, where Arne Jacobsen presented in 1957 the Grand Prix.[133] The exhibition was intended to display the roots and the domain of the industrial design and to refer it to the principle of integration among science, technique, art and society in the modern producing world; to display the most outstanding designs; either of single designers or producing groups throughout the world, presented by means of studies, signs, sketches, models, photographs of the objects, statistical documents, analysis of the market and whatever has given contribution to the

[128] cat_36: Permanent forår, Politiken 24/3/64
[129] 7/7/1969 frederiksborg avisen : stor fremgang for Fritz Hansen
[130] 7/7/1969 Frederiksborg Avisen : stor fremgang for Fritz Hansen
[131] cat_24: kunst og håndværk, Politiken, 11-7-1964
[132] cat_23: Møbler i lange striber; Vestkysten Esbjerg Varde 4/2/64
[133] Field Journal

study and solution of the problem to exhibit the newest production of the whole world.[134] The Triennale was asking to present new materials and to displace them according to the personal taste of the designer so it would be coherent with the designer's personality.[135] The chair designed by Arne Jacobsen was awarded with the first prize, and after that, Arne Jacobsen's chairs started to get sold and advertised in the Italian market.[136]
Internationally, the Serie7 and the Ant were used as chairs for the covers of the exhibitions and for the front pages of the catalogues of the exhibitions of Danish and Scandinavian design. For instance in Japan, Fritz Hansen and Danish pieces of furniture were used as example of good chairs suitable in Japanese home. In Tokyo, for the opening of a big store, Matsuya, they were used to promote the display of Danish furniture. The exhibition was opened in the presence of the Danish ambassador T. Busck- Nielsen and it generated a big interest in public. Matsurya did a big and effective action of interessement; for example, by announcing in Tokyo' s leading newspapers. In the Japanese newspaper it was written that " *in the land of good design, Denmark, Fritz Hansen is known for its excellent design. Matsuya has decided to gather the best things, selected from Fritz Hansen for exhibiting them. Please order them from us.*" [137] Morgens Kock in the 1960s organised a travelling exhibition, *Danish Design*, and mobilised the customers also from other cities, in particular from Atlanta and Los Angeles, to understand the features that Hansen was attaching to the chairs. This traveling exhibition, together with the favourable exchange rate, framed the USA market in such a way that it was willing to buy Danish furniture (in terms of prices, for the American customers it was more convenient to buy Danish furniture rather than American furniture).

[134]documents from la Trienniale di Milano, received in April 2013 at the field visit during Fuori Salone; Sylva, societá italiana arredamenti d importazione

[135]jacobsen_archivio_copia: letter sent by the direct of Triennale to Arne Jacobsen

[136]advertisement material found in La Triennale

[137]cat_28: Demokraten, 1964: oversættelse af en japansk annonce om danske møbler

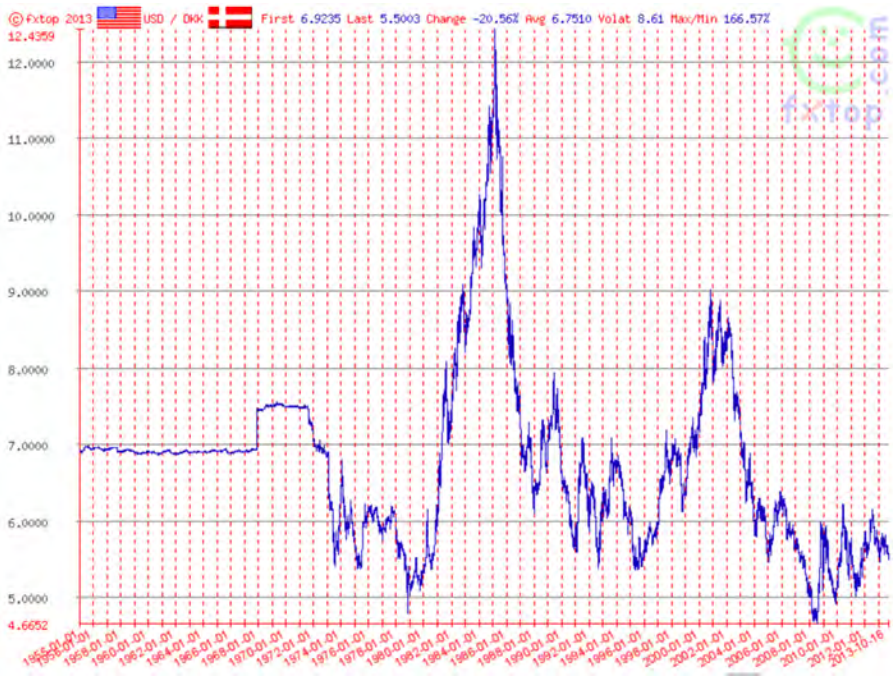

Figure 5.12. Exchange rate US dollar- Danish kroner.

Arne Jacobsen took part in the exhibitions organised in London at RIBA with the furniture manufactured by Fritz Hansen, and he was the first foreign architect being invited at the British Association of Architects. In 1966, a famous impeachment made the chair present in the mind of British and West Countries. Kleer, a model involved in the impeachment of Profumo (for espionage), was photographed naked on the 3107, even if the chair was a copy, and it was circulated around Europe, allowing to increase the recognition of the chair.[138] The picture contributed to increase the number of actors mobilised; also people that were not interested in Danish design saw the chair in the front pages of the newspapers. If not interressed, at least they were mobilised. The chair used in the photo was a copy of the original, but the non-Danish actors could not perceive the difference. The hand-hold aperture cut out of the back was a ploy to avoid the legalities of copyright. Nevertheless, the customers associated the chair with the original chair. Photographer Lewis Morley recalled the photo session which led to the creation of a modern icon[139]

> *This photograph was one of a series of publicity shots for an intended film which never saw the light of day (. . .) The photographic session took place in my studio (. . .). During the session, three rolls of 120 film were shot. The first two rolls had Christine*

[138]Profumo rentvås Christine Keeler-kandalen after syv år, Politiken, 7/november/1970

[139]material collected at the Victoria and Albert museum, where the chair is displayed nowadays

sitting in various positions on the chair and on the floor, dressed in a small leather jerkin. It was at this point that the film producers who were in attendance demanded she strip for some nude photos. (...) She was now nude, fulfilling the conditions of the contract, but was at the same time hidden. We repeated some of the poses used on the previous two rolls of film. I rapidly exposed some fresh positions, some angled from the side and a few slightly looking down. I felt that I had shot enough and took a couple of paces back. Looking up I saw what appeared to be a perfect positioning. I released the shutter one more time, in fact, it was the last exposure on the roll of film. (...) It was this pose that became the first published and most used image.[140].

The chairs were displaced in space and promoted in different countries; a newspaper article stated:

In 5 parts of the world, people sit in chairs from Allerød. A famous chair-making company doubles its capacity - yesterday, the company Fritz Hansen opened its new, major plant, designed by the architect Professor Jacobsen. The distribution and export success of Danish furniture continues to increase, and is mainly caused by a deep knowledge of their quality among the producers, a quality assessment that does not only cover daily operations, but also acknowledges a factor of equal importance within industrial design: aesthetic quality(...) The massive plant, covering almost 6000 square meters, has been raised after the design of royal building inspector, architect and professor Preben Hansen, while the technical parts have been drawn up by plant engineer Hans Engholm. Owners Fritz and Søren Hansen show us around the company, where 400 people are currently employed, although there is a major increase in automation of the production. At first, you note the making of chairs. They are produced after drawings made by a number of our best architects and designers, such as Tormod Olesen, Erik Herløw, Hans J. Wegner, Ejnar Larsen, A. Bender Madsen, Mogens Lassen, Verner Panton, Kristian Vedel and professors Kaare Klint and Arne Jacobsen. The latter is responsible for 50 percent of the factory's production. It has been a couple of years since Arne Jacobsen designed his world-famous, light plywood chair with steel legs, but still, 300,000 copies are

[140]material collected at the Victoria and Albert museum, where the chair is displayed nowadays

made every year by Fritz Hansen Eftf. [10 pressing machines operating eight hours a day, three minutes to make a chair, 450 chairs delivered to stock daily, the stock is never below 13,000 chairs. New press machines are ready to commence production of chairs for St. Catherine's College in Oxford.][141]

Another actor entering in the network was the copy of the Serie7 and of the Ant. Fritz Hansen constantly fought against the copies, that were damaging not only the reputation of the company when they were badly made, but also the the number of items sold.[142] The actor copy/ design infringement was a non-human actor and it was acting as an anti-programme, since it was destabilising the network. It created bad reputation and impaired the exports and the sales.[143] For example, the Danish architect Abel Sørensen reported from Hong Kong that he was in transit from Indonesia, where he has built an hotel with 400 rooms. He went to Hong Kong for buying furniture for the hotel rooms, for the restaurant, and he was referred to go to one of the biggest sellers of the area. He explained the director he was about to do a significant order. Then he got a catalogue from Fritz Hansen, and the director told him he could choose whatever he wanted, and it can be made in a couple of months.

The man did not understand of course any word in the catalogue, but the factory knew how to copy all the furniture. So, men can do Danish furniture around the world.[144]

In the Western region, the countries that were plagiarising the most were Germany and USA. Søren Hansen suited three companies, among which Carl Hansen & Son, for reproducing the Serie7 and the Ant without permission. The judges, after having listened to three experts (two architects and one manufacturer) agreed that the copies were too misleading and of an inferior quality, therefore all the chairs should be destroyed. In one of the sentences it was written:

The company based in Kolding is not longer allowed to produce a chair looking like the one from Arne Jacobsen. After several years of fighting, the court of western Denmark decided that the Kolding based company Borsch Patent stops immediately to produce

[141] 1965 document found in st. Catharine college

[142] Møbelenske- industrien: eksporten stiger støt, men danske møbler møder er stadig skarpere konkurrence på de udenlandske markeder

[143] cat_179: Møblen Industrien, 1968

[144] cat_10: Møbler Vårlden n 9

the so-called Lux chair and destroys existing copies and picture material because it has to be regarded as a copy of a chair that professor Jacobsen has designed for Fritz Hansen in Allerød. During the trial two professional designers, Erik Herlov Tikob and the producer Ejvind Kold Christensen, from Copenhagen, both agreed that Fritz Hansen is right about the other chair being a copy and since they have at the same time agreed, that the chair from an artist point go view is copy protected, it was decided that the Kolding based company has acted against law. The material construction is not protected, only the shape. The companies are allowed to produce the same chairs as long as the shape is different on order to not confuse the chair.[145]

In an interview released after the case, Søren Hansen, who was also the chairman of the association of the Danish Furniture industry, declared:

I can see a chronic and dangerous problem for the industry that is plagiarism, that in these days is more persistent than in the past, and it is bringing a big damage to the chairs as an art. The use art represents an honest quest to get the most practical of things, while it should be joy in a vibrant and inspired expression. Applied Arts is a combination of manual and intellectual effort balanced by work-thing's character. Crafts history can teach us a lot about different ages structure. It uses art idiom to be highly influenced by social, showing technical progress and dwelling habits. Applied arts worked in the past with two aesthetic tasks: the shape and ornament. The decoration was part of the form, but from about the second half of the last century were used ornament often used to hide things practicality. One would like to do things finer and people admired and valued work more for the rich decoration than utility properties and shape. The ornament is now almost abandoned, and instead set the simple form in use art is not only rationalism and objectivity, but which one seeks to provide distinctive expression, both through material selection and design. But unfortunately there with many others a tendency to consider the simplification which are the expression of less originality and a minor artistic achievement despite the fact that the task just out through the simplification requires much more effort and skills from the designer's hand. General fair assessment of

[145] fh 17-1-2012_003: Politiken: 30/ 10/1968 Dømt for plait

the plagiarism issues have therefore been difficult today and requires a greater empathy for the problems than before. Amidst all this simplicity is that in recent years, while a trend has emerged that strongly emphasises and personalisation.[146]

In this episode, the production system changed, and an innovation occurred. The new machineries allowed increasing the thickness of the chairs, by adding two more inner layers of veneer to make them stronger. The seat and the back of all the chairs were made of minimum 10 veneer layers, and 8 of the inner ones were made of beech. The total thickness turned to be 8 mm. The plywood is an actor that became black boxed. The layers of veneer surfaced could have different kind of woods (teak, beech, rosewood, or oak). When these two layers were pressed, it was made a manual sorting where the pieces fitted together in pairs, so that the top and bottom will have to face each other. The production process was modified with the opening of the new factory to make it faster. After applying the glue between the ten layers of veneer, they were inserted in the press for five minutes. Then there was the mould press, the edge of which served as a guide for the milling head. The setup and management of milling was done manually. Next step in the workflow was to glue on the so-called pads in the chairs' bottom. The pad was made of compressed wood and a circular disc with a diameter of 10 cm. It was intended for the installation of base. The attachment of screws was partly manual, but rationalised, so this workflow required only a single man. The last was the final upholstering, partly mechanically and partly hand job, then the chair could be painted. The entire workflow from the first cut of veneer to the finishing before the surface treatment required a crew of 20 men, equivalent to a daily output per man of 25 chairs. After the surface treatment, the rubber feet were applied to the chair, and after this the chairs were stacked together in a very compact way. Søren Hansen was describing in the newspaper this process as rational.[147] The colours used were Arne Jacobsen's "classical colours": black, red, blue, white, curry, and dark green, which were black boxed. In the Fritz Hansen catalogue from 1968, the lacquer series by Arne Jacobsen was introduced: white, grey, red, curry, green, blue, dark green, and black. In 1972, the company for the celebration of 100 years of Fritz Hansen proposed laminated chairs with new colours by Verner Panton, the so-called pan-colours: yellow, orange, red, aubergine, violet, turquoise, green, brown, beige, black, and white.
In this episode, the company was cooperating with different designers: Karen

[146] cat_113: Brugskunst og plagiat af Søren Hansen Berlingske tidendes kronik, 4 juli 1967
[147] cat_49a,b,c: Besøg os i Lillerød

and Ebbe Clemmensen, Nanna and Jorgen Ditzel, Erik Herlow, Tormod Olsen, Peter Hvid and Molgard Nielsen, Arne Jacobsen (until his death), Grete Jalk, Kaare Klint, Karsten Kirkergaard and Henning Francke, Eve and Nils Koppel, Ejnar Larsen and Bender Madsen, Morgen Lassem, Borge Mogensen, Verner Panton, Jorgen Staermose, Hans Wegner. In order to increase the sales of the chairs, Søren Hansen also mobilised architects to design suitable chairs like Peit Hein and Matthenson. As Fritz Hansen was producing different models of chairs and it wanted to keep up with the sales, the management expanded its factory, keeping a rational production approach. The exports around the world were about 5 million of kr. per year (the Danish furniture industry as macro actor was exporting for 200 million of kr. Fritz Hansen exported 55% of its whole production). The factory growth increased. However, due to Danish Government rules, the working conditions changed in Fritz Hansen. The company experienced the first strike in the history of the company, and the it was forwarded to association of workers in the metal industry.[148] Fritz Hansen has also started a collaboration with the technological institute of Copenhagen for developing a quality check process to increase the quality of the chairs, in order to provide a guarantee mark. The new factory, allowed to increase the production space to 24.000 square metres. When Fritz Hansen moved to Allerød and Lillerød, the offices they had in Christianhvan were used for the film industry, and for cultural purposes.[149]The material (screws, rubber feet) were black boxes because they were widely accepted, understood and used in an unproblematic way. However, the laminated plywood and the veneer was not considered unproblematic, the managers and the employees were working on making stronger and thicker, and the press was mediating the betterments by explaining which qualities they increased.

Spokesperson Søren Hansen was the spokesperson of this period, because he was actively speaking in behalf of the chairs and his company, organising events where they could be displaced, organising activities and he actively interacted, negotiated to give shape to the project and to transform it until a market is built (Akrich et al., 2002b). Arne Jacobsen was a macro-actor, because he started a series of goals and steps and intentions to make the chairs circulating (for example, by inserting in the buildings he constructed) and was the representative of the actions happened in his studio.

[148]cat_14: Frederiksborg Avis 1/Nov/ 1969: Ulovlig strejke på møbelfabrik i Lillerød
[149]cat_130: AktualBladet

Features associated and features disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to buy the Serie7 as design chair.

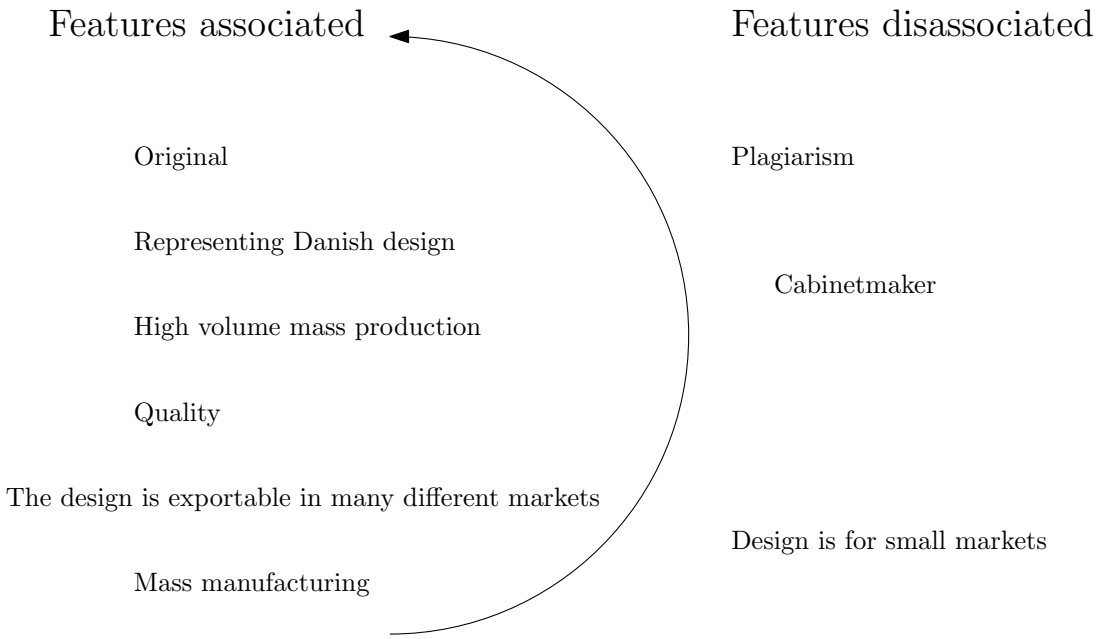

Figure 5.13. Design features as an outcome of choices, second episode. Representation of the process of inclusion and exclusion of the features that the spokesperson worked for and against to support the programme of action of adopting the Serie7.

Through the exhibitions, the spokesperson was framing the chairs by proposing them to public, and through the press, describing them as communicative, intimate, pleasant, suitable for different tastes. The exhibitions or the area dedicated to the furniture of Fritz Hansen were cured by Arne Jacobsen under the direction of Søren Hansen. The way in which the exhibitions were staged framed the chairs as communicative, intimate and pleasant, and that they transmitted good feelings; they were able to bridge the gap between old and the new since they were represented either in old or in modern flats surrendered by old and modern furnitures; they were warm, new, for big environment, modern, Danish, for families, stackable, ergonomic, durable, and of good quality. The interior designers were describing the Serie7 as ideal furniture for the "ideal family" when they were designing the interior displays and advertising it. Søren Hansen, through the collaboration with Fritz Hansen, introduced a system for making the chair more flexible,[150] and therefore more comfortable. The chairs were costing more compared to other chairs present in the market because of the process for producing

[150] bk_146; 156: design collection in Fritz Hansen

them, but at least they were durable: the customers in a long-term perspective would have saved money because they were not required to replace the chairs.[151] Søren Hansen was also describing the chair as not hand-crafted and not made by a cabinetmaker, but made with the modern manufacturing techniques, increasing the reliability on quality.

> *It will make the major producing rational. . . . It is stupid to think that Fritz Hansen is doing everything by hand, in a cabinetmaker way and not having a rational production, but the quality is still high. The chairs are designed by an architect, who has been working very thoughtfully with a prototype. The factory is pushing the architects to play with the prototype that are handmade, and then they look together to a suitable technique for manufacturing. Every year, there are from 10 to 20 models that can enter in the production, but the company is still living of the classic items. (. . .) Until the 1950s it was a local company. Then in 1950 it became an international company, being the leader of the Danish modern.* [152]

[151] cat_111: Alt for Damerne 10/5/66: Af Arkitekt Steen Østeergaard
[152] Korte træk af en lang historie

5.2.4 Episode 3: the increase in the sales (1975-1982)

In the figure, the network of the third episode is presented. It is possible to see that many actors have left the network, others have joined, and some of them have become black boxes, while others are leaking black boxes, because the actors struggled to close totally.

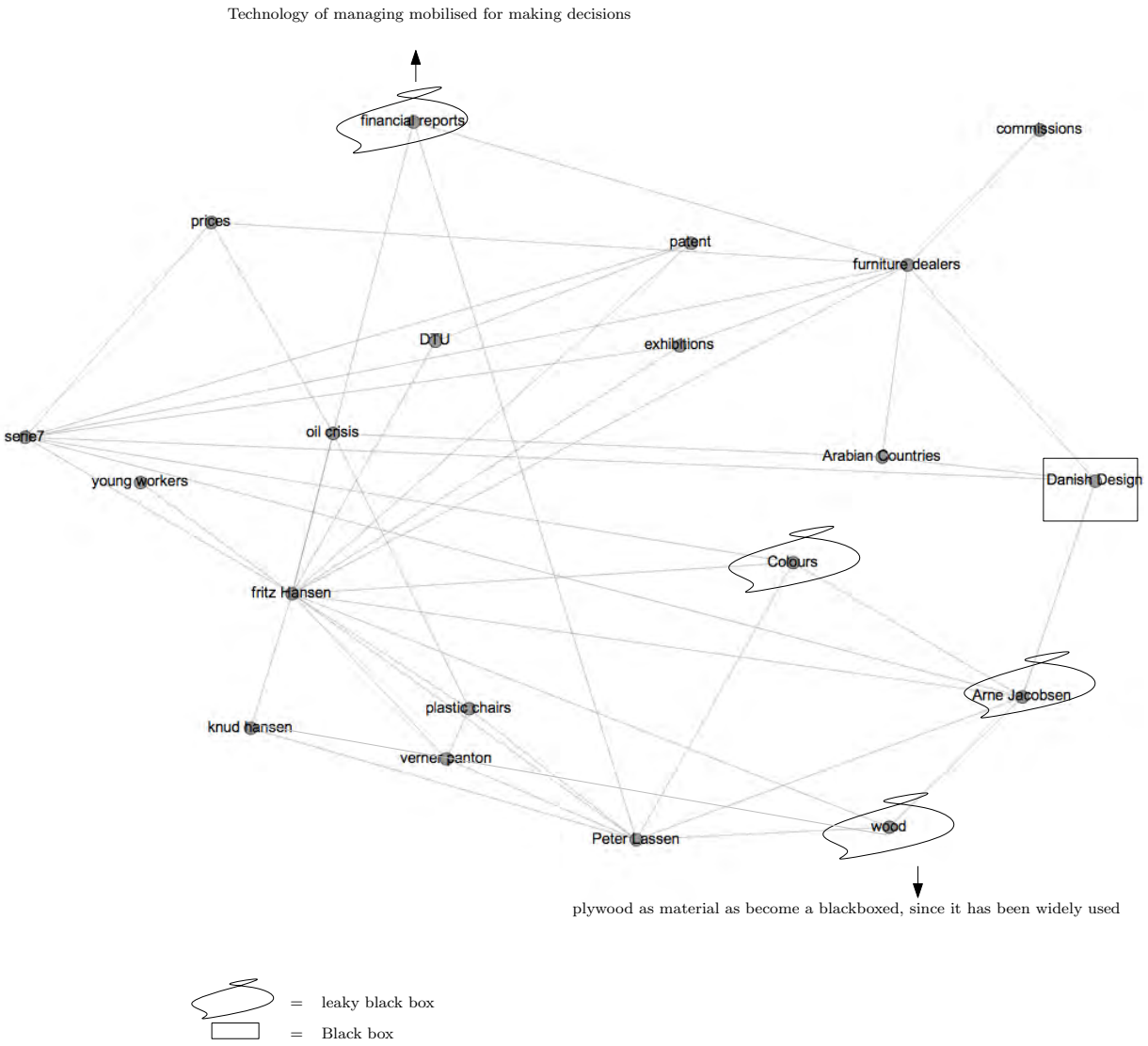

Figure 5.14. Allies in the network, third episode. Network showing the allies enrolled and their relationship in the third episode, during which there has been an increase of the sales, during a period of 7 years.

Allies in the network The following table represents the allies in the network that supported the increase of sales of the Serie7.

Advertisement pictures	Arabian countries	Architects associations	Arne Jacobsen
Ant Chair	*Colours by Arne Jacobsen*	Colours (others)	Denmark
Danish Design	Danish kr	Design awards	Design exhibition
DTU	Exhibitions	Financial reports	Exchange rate
Fritz Hansen	Furniture dealers	Knud Hansen	Laminated plywood
Oil crisis	Patent	Plastic chairs	Meeting rooms
New buildings	Newspaper articles	Offices	**Organic design**
Other woods for the external part	Press articles	Peter Lassen	Young workers for the machineries
Young workers	Plastic pollution	Verner Panton	
Søren Hansen	Tubular metal legs	Serie7	Showrooms
Veneer	UK	USA	All the machines use for producing the chairs

Table 5.5. Allies and black boxes in the network of the Serie7 chair, third episode. The allies in the network in blue are human allies, the red ones are non-human allies, the black one is a black box, and the ones in italics are leaky black boxes.

Translations, mobilisations, enrolment

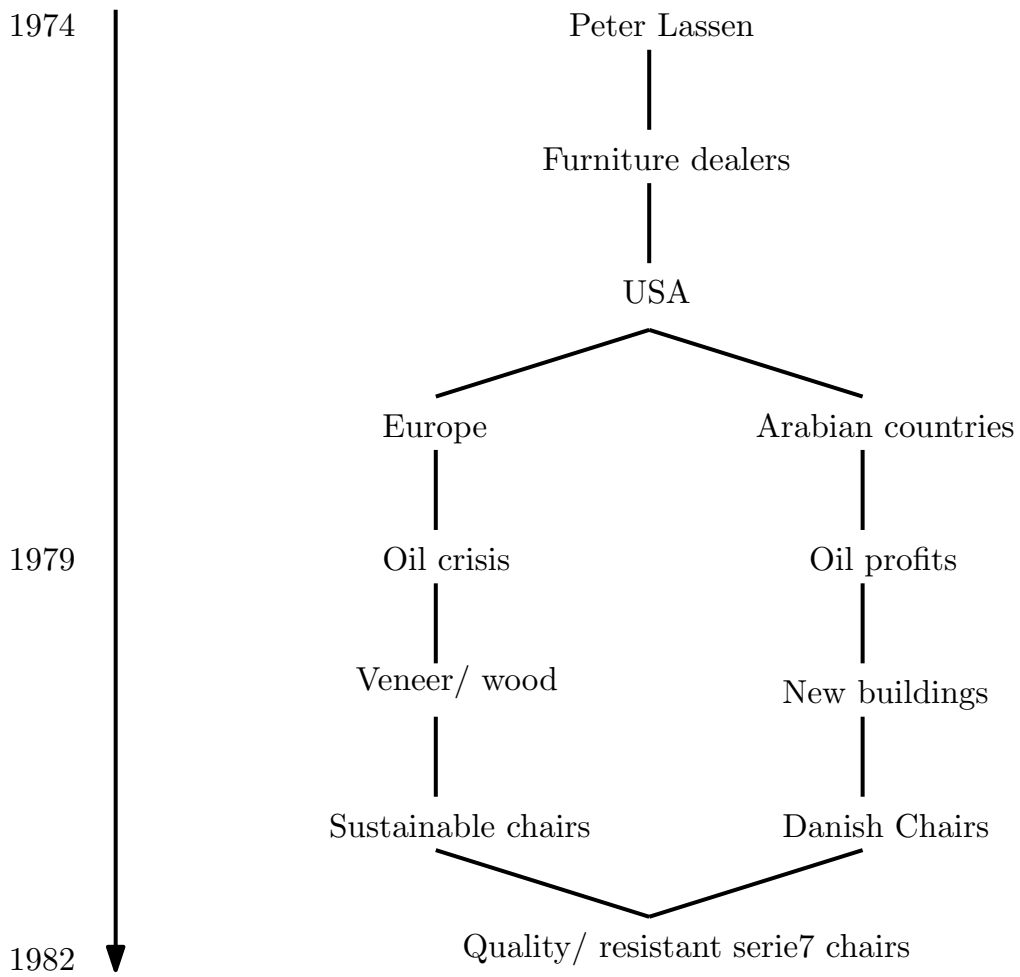

Figure 5.15. Translations, third episode. Overview of translations that Peter Lassen initiated and which made the Serie7 as quality and resistant chair.

During this episode, the sales of the Serie7 increased drastically. At the beginning of the 1970s, Peter Lassen, new CEO of Fritz Hansen, invested in the design of Verner Panton, considered funkier than the design of Arne Jacobsen, who died in 1971. The chairs of Verner Panton were pop, made of plastic, considered a new and interesting material, and the company invested in changing the production from wood to plastic. However, the in 1970s at the time of the oil crises, Fritz Hansen was almost about to fail economically. The prices of the raw material increased dramatically due to the oil crisis.

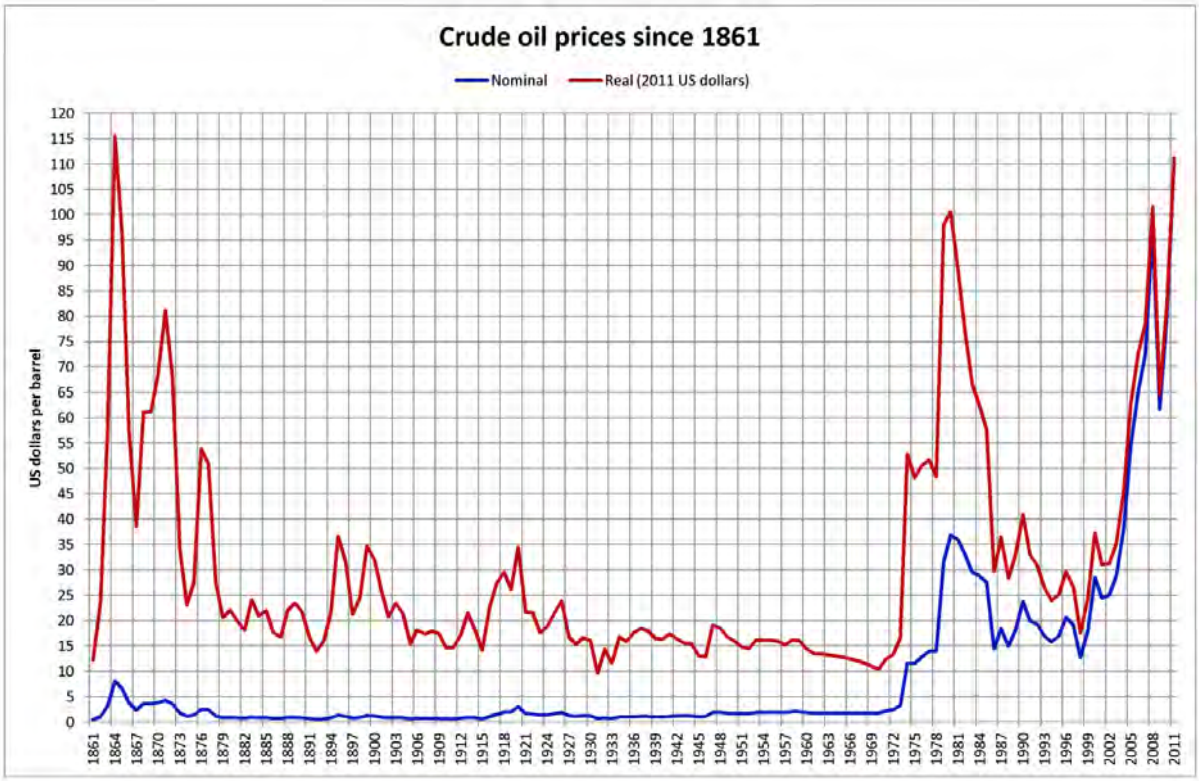

Figure 5.16. Oil prices in the years from Wikipedia, November 2013.
153

In the minutes from the meetings at Fritz Hansen Company, it was written that

> *the sales were not like earlier happening automatically, and losses were unavoidable; a new strategy and a new capital were necessary.*

CEO Peter Lassen declared:

> *exactly during the oil crisis we developed a new shelf system in plastic. With 100% increase in the price in plastic we had a product that was good enough, but no one wanted to pay the price. For this product alone, we lost 1,2 m. of kr. what we have invested in the R&D. We have to be critical on ourselves and look to which of our product could be sold. The amount of product were decreased from 200 to 150. An expansion of varieties and systems increased the numbers to 170. It was decided that the product should be characterised by quality, function, design and safety. The last thing is about constant taste, service and a good*

economy.[154]

The solution for rescuing the company was to sell to be acquired by the Scandinavia Tobacco holding. Skandinavisk Holding A/S took over 75% of the shares in Fritz Hansen:[155] at the moment of the acquisition, Fritz Hansen had 170 employees and a 9000- square metres factory. After the acquisition, the CEO from Scandinavian Holding declared:

> *There is a tendency towards integration in the furniture business, where the largest companies get larger by buying smaller companies, and when the inner market becomes a reality this tendency will grow even stronger - the small companies will have a hard time, and the big ones an easier one.*[156]

Knud Hansen, with the function of wood merchant, became a central figure in the company, responsible for the most valuable raw material of the company: the wood. During the oil crisis it was decided to convert the production from plastic into wood and plywood, privileging the big commissions and the use of wood, considered a green resource, clean, not as polluted as the plastic materials, sustainable, respecting the environment and cheaper. The production decided to focus only in few models for being efficient and reduce the costs of changing the moulding form; the managers decided to focused on the Serie7, the most appreciated chair in Europe and USA, especially after the travelling exhibition of Morgens Kock. Peter Lassen declared:

> *In the 60's people thought of furniture as something you got one day and changed the next and therefore were not allowed to be too expensive. This viewpoint is still present, but the philosophy of recycling is on the increase. When we produce and sell more it is because the consumers are becoming more reasonable. Economic people do not like to throw things away. And you don't trow our things away. They can be used for generations, and are therefore recyclable.*[157]

To increase the quality of the chairs, Fritz Hansen invented, in collaboration with DTU, a patent for increasing the flexibility and the strength of the back of the chair.
In the a meeting in 1979, Peter Lassen asserted that the sales of the Serie7

[154] fh 17_001: aldrig før så gore omgivelser
[155] fh 17-1-2012_0001 copy: Dansk representation bygget Fagene
[156] fh 17-1-2012_004 copy: database pictures from the warehouse
[157] møbelfabrik vokser; håndværket er glemt hos Fritz Hansens Eftf

increased consistently, and the primary reasons were to be addressed to the improved strength of the laminated chairs, so they could resist even to the hardest pressure. Furthermore, he suggested that also the travelling exhibitions in Europe, the use of furniture dealers, the participation in the fairs, the possibility to buy coordinated accessories (like tables), the creation and distribution of catalogues and brochures with the Serie7 in the front page, and the advertisement in commercial and specialised magazines contributed to the increase of sales of the Serie7.[158] Due to the criticality of the plywood material, and how it could affect the quality the manufacturing, the company decided to open a new school for teaching the young employees how to work with the wood.[159] At the organisational export level, Peter Lassen, opened a new division in Canada, Montreal but it was closed after a couple of years, due to the oil crisis. The sales in England and West Germany, instead, were very positive.[160]

Furniture dealers were new professionals created in the company, changing the sales strategy. Before the introduction of these professionals, the sales were conducted on personal relations and visits of employees of Fritz Hansen to the customers, and during the fairs. Instead of basing the sales on one trader, Peter Lassen decided that the representatives should be created as professional figures, trained to stimulate the interest in the chairs, and they were traveling around Europe (each country twice a year) to follow and support the sales. In Denmark, the shops mono-brand had trained furniture dealers that were able to explain the details of the chairs and invite the architects to try them. The sales workers were asked to be focused on three main markets: Denmark, Sweden, and West Germany and on three secondary markets: Holland, France, and USA.[161] The sales were divided in 70% big commissions and the 30% private market; therefore, there was the need of specialised persons with the goal of interesting the architects and the governmental buyers to advise and to convince them to use Fritz Hansen furniture for the interior design of companies and institutions. Fritz Hansen worked on framing the architects and interior designers to use Fritz Hansen furniture. Peter Lassen had also created the figure of the furniture dealer. This person had to conduct them in the shops (seven were opened in Denmark for this purpose) and invite potential customers to try the items. Peter Lassen also created the schools of apprenticeship because in the middle of

[158] fh 17- 1- 2012_0001: database of the pictures from the warehouse

[159] fh 17-1-2012: database of the pictures from the warehouse: møbelfabrik vokser: håndværkt er ikke glemt his Fritz Hansen eftf.

[160] minutes from the meetings

[161] fh 17_001

the 1970s, there was a generational problem: the persons that in the 1950s and 1960s were in charge of the machineries and of the finishing of the Serie7 were retiring, and the new work force did not have experience for using the machinery. The company did not focus in retaining the competences, since the production was moving into the plastic. However, due to the decision of focusing the production on the Serie7, the machineries of that time needed personnel able to manage them. Therefore, Peter Lassen created a new programme, the apprenticeship, to use the employees that were about to get retired. Danish design was black boxed and the chairs were associated with the features of quality, class, to the work of Arne Jacobsen, Finn Juhl and Hans Wegner, contrary to the Italian and USA design that were evolving, and proposing new and young architects, while the Danes kept proposing classical furniture. However, the new furniture items were "masterpieces" chairs that were considered to be as good in quality and resistant as the Danish ones.
The increase of the oil price produced another consequence. The Arabian and Oil countries with natural oil receives and countries that produced oil became very wealthy and willing to pay for design quality. The Scandinavian design was defined as

> *high formal discipline, result of a responsibility that still considered itself so close to the rudiments of modern development that it was not capable of being superficial or precipitous.*[162]

An actor that enrolled the Serie7 in their network of Arabian Countries in different articles was the Libya University. The press entitled this episode as

> *the quality wan the competition: new big orders for danish furniture company.*[163]

One of the orders for Fritz Hansen company were 4000 Serie7 for the University in Bengasi in Libya. After that, it received another order from Libya for 660.000 chairs.[164] In one article it was written:

> *This shows that Danish design in quality can make, even though it is a bit more expensive.*

In the article it was explained that the first order made from Libya was of 4000 chairs. For the second part of the university, the chairs ordered

[162]Sembach (1997)
[163]fh 17- 1- 2012_0001: ny stor ordre til dansk møbelfabrik; oktober 1973
[164]fh 17_001: picture from the warehouse document.name of the article missing

were from Italy, because the Danish chairs were considered too expensive. However, the chairs were not of a quality that was as good as the Danish one, so the university threw them away and ordered the Serie7.[165] The CEO Peter Lassen commented:

> *this shows that there is good economy in buying quality.*

In some schools, the students were asked to try different chairs and they were choosing the Serie7 for the comfort and back support. The exhibitions were decreasing, and they were, according to the data collected, substituted by fairs and showrooms.[166]
The very high positive peak in sales, therefore, seems to be fostered by the the oil crisis that forced Fritz Hansen to concentrate their production on plywood; the decision of the management to focus the production mainly on the Serie7; the creation of different colours and variants; the capability of the dealers to convince customers to buy it; the presence of the actor Danish Design, which framed the actors with the features of quality, comfort and being long lasting.

Spokesperson Peter Lassen was the spokesperson in this period, speaking on behalf of Fritz Hansen Company and the chairs and making decisions on the production of items.

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept and buy the Serie7 as new design chair.

[165] fh 17_001
[166] Politiken, 1973

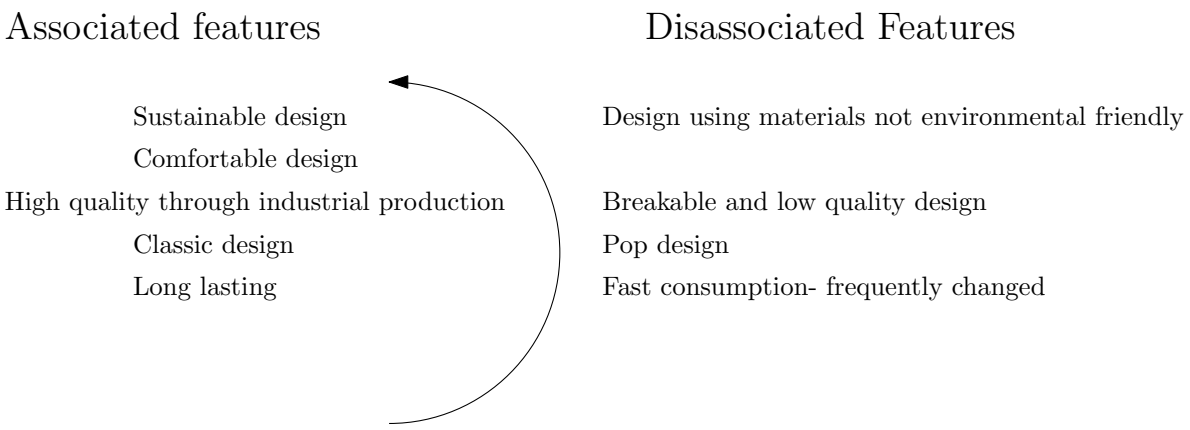

Figure 5.17. Design features as an outcome of choices; third episode. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of increasing the sales of the Serie7.

The new CEO invested in the production of plastic chairs by Verner Panton, but due to the oil crisis, the factory had to reconvert the production and use the wood again, which was a cheaper material. The management decided to decrease the variety of chairs produced and to focus mainly on the Serie7; the bank SDS helped with the capital, allowing to focus on the production, which increased to around 20% in two years.[167] The number of employees in 1973 was: 76-white collars workers and 155 workers, whereas in 1977, there were registered 57 white-collars worker and 100 workers in the factory, and about 40% of the production was exported.[168] The company was almost in bankruptcy and it was bought by the Scandinavian Tobacco Holding in 1978. The company was relying on the heritage of the past because in the interviews for the press, Peter Lassen was referring to the quality of Danish Design. The plywood was black boxed, allowing to attach features to the chair that were associated to it in the previous episodes, without having dissident actors working against it. The Serie7 was featured as ergonomic, offices-friendly, flexible, Danish, resistant, of good quality, reusable, in the sense that it can be used by different people and the mothers were giving it to the daughters or sons once they moved out from their home; and sustainable because it was made of wood and not of plastic. In this episode, the environmental movements were mobilising the attention on the pollution caused by plastic and wastes. The plastic objects were damaging the environment and polluting the rivers and the water sources because they came from petroleum products and produced dioxin when burnt. Therefore, Peter Lassen was mobilising the value that was sustainable as an alternative

[167] fh 17_001

[168] fh 17_001: collection of the papers in the warehouse; Danske møbler i amerikanske hjem

to the plastic chairs that were considered polluting.[169] Being of good quality and resistant, therefore, these products did not had a drastic impact on the environment, because they long-lasting and minimising the waste. The chairs were disassociated from the feature modern chair. They were not innovative, but kept the same design for many years and improved the quality and the comfort.

[169] fh 17_001: from a collection of newspapers found in the warehouse

5.2.5 Episode 4: The decline of the Serie7 (2002-2013)

In the figure, the network of the fourth episode is presented. It is possible to see that many actors have left the network, others have joined, and some of them have become black boxes, while others are leaky black boxes, because the actors struggled to close totally.

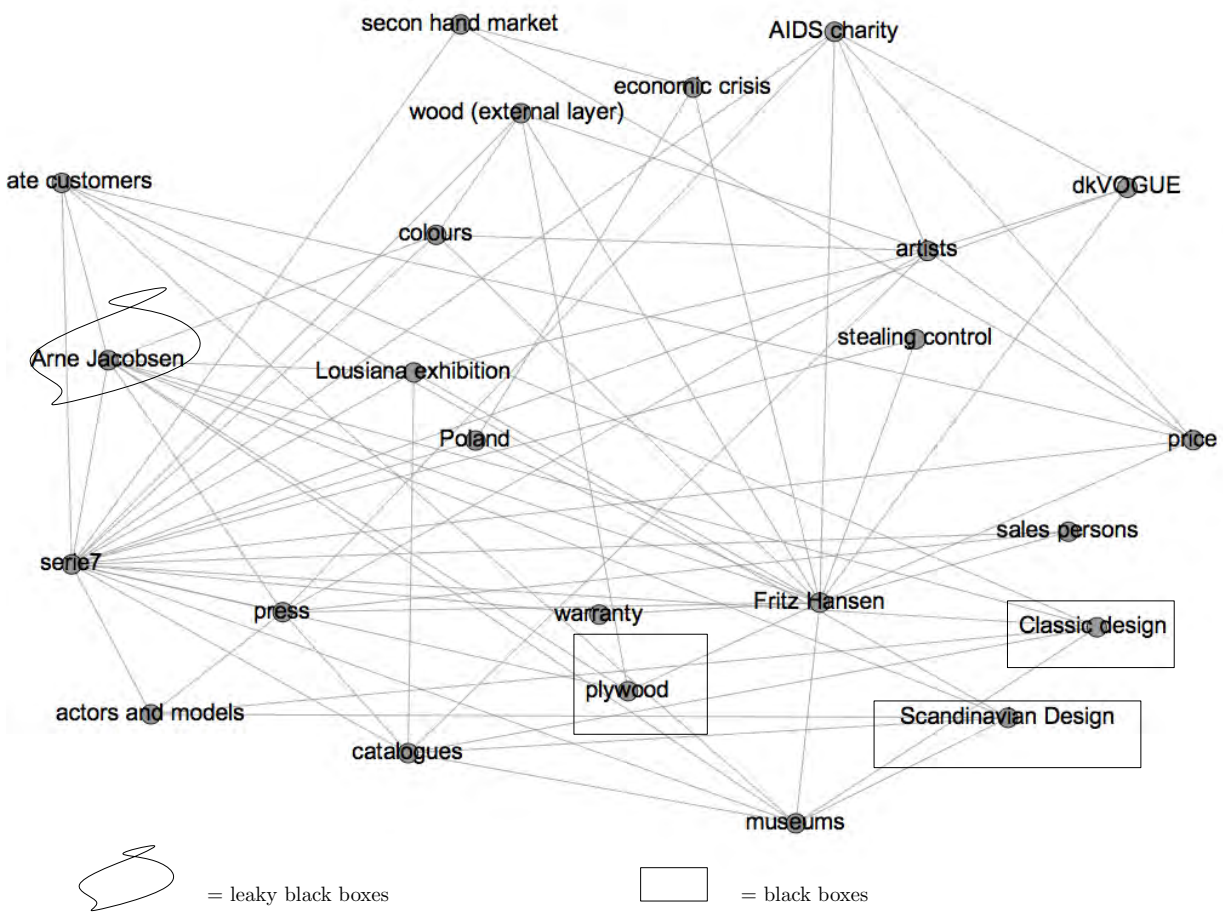

Figure 5.18. Allies in the network. Network shooing the allies enrolled and their relationship for sustaining the sales of the Serie7, covering a period of 10 years.

Allies in the network The following table represents the allies in the network that were in the last episode of the Serie7.

Advertisement pictures	Anniversary of the Chair	Architects associations	Anniversary
actors and models	Artists	AIDS campaigns	*Arne Jacobsen (values/ qualities of)*
Catalogues	Classic design	Channels (television)	Colours (others)
DKVogue	Danish kr	Economic crisis	Exhibitions (art exhibitions)
Financial reports	Financial crisis	Fritz Hansen	Furniture dealers
Factory in Lillerød	Furniture dealers	*Laminated plywood*	Louisiana exhibition
Museums	Poland	Price	Private customers
Second hand market	Sales persons	**Scandinavian Design**	Serie7
Stealing control	Warranty	Wood	

Table 5.6. Allies and black boxes in the network of the Serie7 chair, fourth episode. The allies in the network in blue are human allies, the red ones are non human allies, the black one is a black box, and the ones in italics are leaky black boxes.

Translations, enrolment, displacement

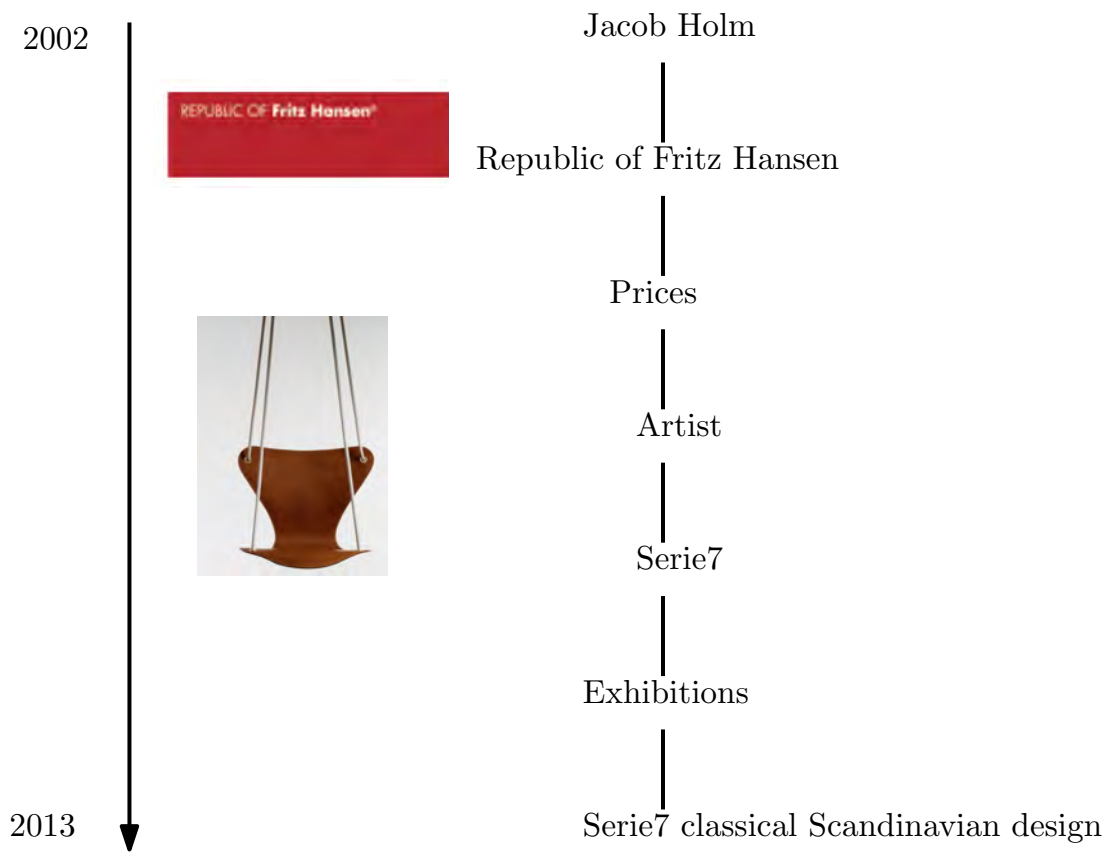

Figure 5.19. Translations, fourth episode. Overview of translations that Jacob Holm initiated to make the Serie7 a Scandinavian icon.

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Fritz Hansen Company has been manufacturing a series of laminated veneer chairs designed by Arne Jacobsen, and the gamma is based on the variety of woods used for the external laminated veneer and the colours. The outer veneer is available in nine different veneers: maple, beech, ash, elm, oak, Oregon pine, cherry, walnut, and dark-stained oak. The children's chair (3177) is only available in beech and walnut. The inner shell is made of pressure-moulded veneer. The inner veneer is always beech and is black boxed, made unproblematic, while the external part is frequently discussed and changed. In 2013-2014, the external shell is also available in two finishes: wood coloured or lacquered in 9 different colours: white, light grey, dark grey, black, yellow, orange, red, petrol blue or sage green. The children's chair (3177) is only available in coloured ash. The base for the models 3107, 3207, 3177, 3187, and 3197 is 14- mm chrome steel tubes with 4 legs and leg ferrules of black synthetic material. The swivel base for 3117 and 3217 is 14-mm chrome steel tubes and 5 hard-wheel castors with aluminium caps (soft wheels also available). All models (except for 3177) are also available

with front or full upholstery in fabric or leather.[170] The range of accessories includes short and long linking devices, writing tablet (only 3107), transport dolly, seat and row numbers and large seat cover for improving the stackable part on upholstered chairs. [171]
2013 Triennale displayed the Serie7 in the dedicated area: Danish Design, consequence of the fact that the Serie7 has been translated into a chair considered classical, Danish and Scandinavian; revived by the museums:

> *there also design trends of course, suddenly the '50s are very trendy or certain material is very trendy, or the design language is very trendy.*[172]

Numerous museums around the world have in their collection the Serie7, not only as sitting chair, but as model to exhibit, including the design museum in Copenhagen, Victoria and Albert Museum in London, SFMOMA in San Francisco, and MOMA in New York.
In 2002, Lousiana Museum, located north of Copenhagen, held an exhibition on Arne Jacobsen. The exhibition mobilised the customers and the press, and they started to have interests again in Arne Jacobsen and his design. This also mobilised some architects to write books and catalogues about Scandinavian Design, Arne Jacobsen and the Royal Hotel in Copenhagen. In 2005, the management of Fritz Hansen decided to collaborate with the Danish AIDS Foundation to coordinate a fundraising auction. The brief for the exhibition was: *how would the Series 7 Chair look today if you were given a free hand to design it?*[173] The designers who were enrolled in this call were Birger Christensen, Bisazza, Camper, Diesel, Georg Jensen, G-Star, Hugo Boss, Hummel, Louis Vuitton, Mandarina Duck, Missoni, Kris Ruhs, 10 Corso Como, Paul Smith and Royal Copenhagen.[174] Camper's redesigned it as an idyllic swing; Royal Copenhagen's hand-painted floral arrangement with gold inlay and Paul Smith inscribed the classic British stamps in a Union Jack pattern. The collection was toured in London, Milan, Copenhagen, New York, and Tokyo. It ended with the auction for the fundraising for the Danish AIDS Foundation to combat HIV in Africa when auctioned at Bruun Rasmussen.[175] In 2006, the chairs were exhibited in Triennale, Milano during the design fair, and then they started a travelling

[170] field journal, information available in the commercial catalogues
[171] Serie7_product fact, information available on the commercial catalogue
[172] interview with the design manager
[173] information found in GUF, the internal journal
[174] information found in the museum of Lillerød
[175] interview with the brand manager

exhibition. In 2007, the chairs were exhibited again for another fundraising event. It was hosted in California and organised by dkVOGUE. After the payment of a ticket, the participants present at the event had the possibility to win products manufactured by Fritz Hansen.
In 2012, the company revitalised the concept of furniture made in wood, not coloured, to be true and not hide the beauty of the wood.[176] In an interview the brand manager affirmed:

> *this is also part of revitalising the product. Few years ago, we introduced something called design colours. Not completely new colours, but an initiative where seven young designers were asked to decorate the chair. The aim was to decorate the chair to give a fresh look, to link to something that is not always old . . . it is very well know in some market, like in Denmark. Sometimes we had price issues, so the local market need a bigger effort for communicating the quality, the better quality comparing to the the competitors and the copies. It is sometimes a matter of finding a new story. We have few challenges, especially outside Denmark, for explaining why the original is better than the copy. For people who know us, who know our products, they know we stand for good quality. . . it is also about exploring the possibilities. For new customers obviously we need to share the story behind the product, the ideas, and the concept behind that combined with all the practical details, like the Series7 lasting much longer than all the other things. . . but that kind varies from country to country. . . but we can say we don't have a local communication our marketing it is handle on the global scale, we don't divide on a local scale. . .*[177]

The communication is not differentiated between private and contract market; they are treated in the same way.[178] The two actors struggled with the network construction of the sales: the increase of prices and the economic crises. The increase of prices was a strategy decided by new CEO, Jacob Holm, to position the chairs on a more exclusive market. To give a strong signal that the company was changing, the branding strategy and the target market became focused on the private market, and the company changed its name into The Republic of Fritz Hansen. According to the former designer, who was working in Fritz Hansen at the moment of transition, the motivation

[176] interview with Jennie
[177] interview with Louise, director of the communication
[178] interview with Louise, director of the communication

was strategic, in order to interess different markets, and economic, because the margins were low in case of big orders:

> *Prices have to be incredibly high, our philosophy was: maybe we will no longer have those big orders for the 7 chair of 500 or 1000 or 1500 chairs; it doesn't matter, because when we sell so many chair, the discount is so high that, even if we sell 2000 chairs, we do not earn a lot of money, instead it is much better idea to sell 300 chairs at higher price. And so automatically the price level of the chair rose, the sale number went down, but you know, Fritz Hansen turnover grew, and the income and the profit grew as well, and also Fritz Hansen as company gradually, also because of other activities, but surely increasing the price helped Fritz Hansen to be considered a luxury good more and more(. . .)and as I mentioned the rises in prices has certainly prevented the sales to go more up. I am quite sure that if it's a price of the Serie7 chair would have been kept down, today the sales would be more than two or three times higher than they are. But that has been a conscious strategy at Fritz Hansen, not selling high volumes without profit. Instead, selling much lower volumes with higher profit and establishing the company as luxury brand. I think it has been a very good strategy for the company, and it has certainly helped to establish it, since they were not internationally established when I started in Fritz Hansen.*[179]

The Serie7 has become double expensive in 2002. It is becoming more expensive as part of the strategy also; however, their production costs have also increased.

> *At the beginning people where buying Arne Jacobsen and Poul Kjærholm's chairs because of their functionality and of the design of course, but I think at least at the beginning of the century, people bought for status reasons, they are expensive, people want to show off, and suddenly that became the main purpose to buy that products, and I think the positive part of the crisis is that now is changing, people are not buying to show off, but people are buying for functional reason, they know these products are high quality and they will last. I think that is a positive development, and this is also the story we want to be part and not only status.*[180]

[179] interview with the former design manager

[180] Interview with the design manager

When questioned about the reasons for the decline in sales in the last period, the employees in the company has argued unanimously that the decrease of the sales was due to the financial crisis. The market that suffered more from the crisis was the retail market

> *because in the contract market, with architects, it is still well known and their responsibility especially during poor time, is that they need to last as long as possible. . . and because we are very well known, the quality is very long lasting. But the contract market was nearly as bad as severely hit the retail part. The retail part is coming back, but we have a lot of troubles and we had to struggle lot more. And then applies for all our furniture.*[181]

Also according to the current design manager, the financial crisis had a positive impact on the Serie7

> *Of course there are economical issues that are important; in time depressed like now people are not buying expensive furniture . . . In time of crises people are getting more and more conservative, they go for the safe choices, they do not risk as much as when they have more money and they can do what they want. And that is also positive for us because people consider more carefully what to buy and people go for quality and I think it is very much a good thing for us at least, we believe you should buy quality without throwing away money, keep them for a long time, and gives to kids and grandchildren . . . it doesn't sound like a good business model but . . . I think it makes sense for us and it is also part of our CSR strategy that we want to prove the sustainable quality, we want to be sustainable without compromising the quality of the products, we believe that exclusive design, high quality, stability is part of the same solution and this is hat we are working on. Of course it is not something you can do from one day to another, but it makes sense for us, and it is part of the DNA of the company and of course we are all the time looking at new materials that can substitute some of the materials we present use.*[182]

During an interview, the former design manger emphasised that the crisis made the customers more aware of the value of the Jacobsen's chair, because they are a secure investment and can be sold in the second hand market:

[181] interview with the brand manager
[182] interview with design manager

when there is a kind of instability, political or economical, people tend to buy the classic, not new products. We have seen very clearly that when the financial crises started few years ago, the new products were hit much more that the classic. People want to buy the classics, not new products. When we are talking about Arne Jacobsen and the classic furniture, like the Serie7, there is also a very strong second hand market, it means that if you buy a new chair, you can always sell the chair, maybe you can never have the original sum of money back, but if you are buying an Arne Jacobsen chair, you can have maybe half of your money, or 60% of your money back. While if you buy an Ice chair you can maybe get a 10th. That is seen a much more better investment, because there is a much stronger second hand market. It is a kind of product that young people would like to have, and they want to buy used, so many people would buy a second hand Serie7, Egg, Swam, and therefore there is. In a time of an international crises, you tend to get back to the classic, you tend to invest in the classic, whereas in the good time, people have money allow themselves to invest in new and unknown products, and this is very important, especially when you look at design and furniture office, and that is similar to other design products, they can always be used; but when we are talking about a chair that is 50 years old, that can still be a good chair, and it can become also a more beautiful, if they age in a very nice way.[183]

In USA, there has been a flourish in the second-hand market and collector's market in selling and buying Scandinavian Design items.[184]

Other factors that have influenced the recent increase in interest in modern classics is the fact that originals and early production models are highly collectable, they are still affordable and are proving to be a good investment. Along with furniture, there are plenty of opportunities to buy related items, such as studio ceramics and glassware, fabrics, lighten, radios and even original artworks. The abundance of TV collecting shows demonstrates that there is fun to be had searching through secondhand shops, flea markets and local action to discover those elusive bargains. The success of Internet auction sites, such as eBay, is a further

[183]interview with Bjorn

[184]book on scandinavian design

testament to this. With the potential of beautiful and affordable bargains to turn into valuable collector's pieces, we are eager to learn more about the great Modernists and the designs they created.[185]

The feature classic design has become attached to the Serie7. Scandinavian was included in Denmark, Sweden, Finland.

it is a remarkable endorsement of the greatest Scandinavian designers that large numbers of their products not only succeed in looking stylish, relevant and fresh many decades after they were first made, but also that they are still in production and continue to appeal to new generations of home-makers. While some of these design classics date way back to the 1930s, they have a timeless quality and look as good in the most minimal of loft apartments as they do in a family home.[186]

This has stimulated the development of the second-hand market:

go into almost any major auction house these days and you'll be sure to find special sales dedicated to modern design (...) Mainstream shops are also full of these classics- sometimes they are original designs copies, today under license, and sometimes they are cheap, but convincing, imitations- so it is clear that the appetite for modern furniture is greater than ever (...) for others it is the sculptural and beautifully crafted designs in wood that are associated with the Scandinavian Design.[187]

Therefore, the actor Scandinavian Design has contributed to strengthen the relationship of the customers to the Serie7. After 2002, two new actors entered in the network: the stealing control and the warranty. Concerning the stealing control, if a Fritz Hansen product was stolen, the customer could enter in the website and register the product and could have the product back if it is found

When you opt for the most exclusive Fritz Hansen furniture we have chosen to provide an extra protection by marking your new furniture with a unique number. The number is discretely embossed in the frame and figures on a card you receive when you

[185](Fay, 2012, pg.9)
[186](Fay, 2012, pg. 49)
[187](Fay, 2012, pg. 7)

purchase your furniture. This is regrettably no guarantee that the furniture will not be stolen. Should this happen - and once you have notified your local police, we recommend that you register your stolen furniture here on Fritz Hansen's website. In order to register your furniture, you need to become a member of our new service - My Republic. My Republic is your personal profile at Fritz Hansen.[188]

Concerning the warranty, standard goods have warranty for five years against manufacturing defects (that is, materials and design). The warranty does not cover leather and other fabrics ordered or special material; normal wear and tear and damage of covers are not covered by the warranty. Fritz Hansen offers up to 10 years limited warranty if the products are registered online.[189]
In the stores and showrooms in Denmark, the focus is given to the chair, to the Serie7, but abroad (in the shops in London, Oxford, Milano, and Padova), the focus of the retailer is more on the life of Arne Jacobsen, on the prestige of this actor, rather than mobilising the discourse Fritz Hansen as manufacturing company. Therefore, the news about the re-allocation of the factory in Poland was not relevant for the showrooms in Italy and UK (the employees were not informed about this process), while in Denmark it created a mobilisation of actors.
The management decided that the factory in Lillerød, built in the 1990s, was too old for modernising; in terms of costs, it was cheaper to open a new factory in Poland. The announcement created some struggles in the company, and the workers in the factory were complained that apart from loosing a part of history of Fritz Hansen, they were loosing their job. Some orders were returned when the customers knew the chairs were made in Poland, but the financial manger affirmed that the quality is even higher because Polish workers were more attentive and listen more than Danish workers. However, in the factory the argument supported was that the Danish workers had such a long experience that they could recognise any defect and produce products of extremely high quality; a capability that is acquired though the years. The system of mistakes and defects of the wood encompasses several definitions, therefore, the employees have to acquire experience before recognising them.[190] The CEO, in different newspaper articles, declared that was a decision mobilised by the lower wages and lower taxes in Poland, but this would not impair the quality of the chairs. This decision created tensions in the

[188] www.fritzhansen.com/my-republic- 23rd of November 2013
[189] fritzhansen.com/my-republic, checked on 23rd of November 2013
[190] interview with HR director

company:[191] the workers in the factory were going to loose their jobs (they cannot be relocated to Poland) and they complained that the top management promised them educational and professional training for helping them in finding a new job.[192]

Spokesperson Jacob Holm, the new CEO of Fritz Hansen.

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to buy the Serie7 as a classic design chair.

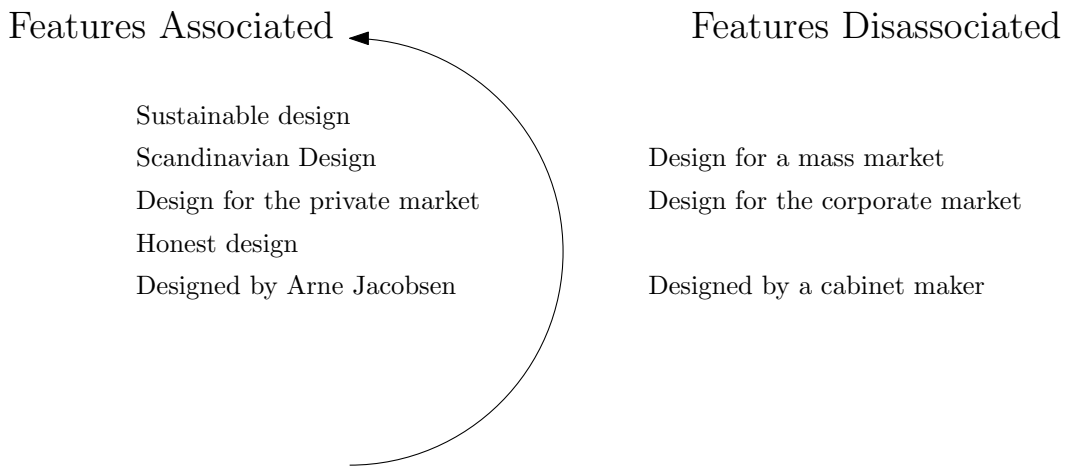

Figure 5.20. Design features as an outcome of choices, fourth episode. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of increasing the sales of the Serie7.

The design manager, during an interview, explained the three values that Jacob Holm has chosen to promote:

> *We work with design at 3 levels: visual level, emotional level and irrational level. The visual level is about the immediate attraction you see something you find attractive it is beautiful, and you want to know more about it. At the visual level we have 3 values which are: original, pure because if we look at the introduction of the Egg, the Swam, the Series7 chair, these new stick, pure design language to introduce in Fritz Hansen that the others don't have. We are not too much in ornamentation or too many not necessary things that are not necessary for the function. We want things to*

[191] field note, visit in the factory
[192] GUF magazine

be as pure as possible, easy to read, so they can be iconic. That's not because we don't like ornamentation, it's just because it is not right for the brand. And the last value is long lasting for the visual level, because we believe we spend a lot of energies and money to make high quality and it would be a pity if we make something very trendy or short life because it was very trendy. I think it was Coco Chanel that once said the only frustrating thing of being fashionable is going out of fashion very quickly and this very true, so we try to not fall in this short-life trends, but being very much aware of not being to fashionable actually. So we try to be as long lasting as possible because we want our products to have a long life span. So we say that the value long lasting should not only being about high quality but should be strong, resist many years but also being long lasting visually. And then there is the emotional level that is about all the things that are, I would say, hard to articulate, like when we fall in love with a person. So at the visual level we have three values: genuine, serene, and Danish. The first one, which is genuine, is about be honest, we want our products to be real materials: this is a real piece of metal, it is not plastic, this is wood, we don't want to hide this is wood, we are not try to fake surfaces, we are not trying to make something that is not easy. We are not trying to paint the wood, we are not trying to paint the aluminium legs to make them look like wood. We are trying to make the products as honest as possible, so that what you see is what you get. The second value serene is about the atmosphere the product creates. We want our products to be understated, calm, and of course serious, we are not funny or silly. We can have some humour in our products. (...) And the final value is Danish and that's is actually what we haven't focus a lot in for many years, we have worked a lot with recently. I don't know why we haven't focused that much but we want to focus more in being Danish. We have a fantastic heritage, we have a lot of classics in our collection, we have created a lot of the Danish design gold pages, why don't stand on the shoulders of that heritage and try to look further? This can makes more powerful power brand and we have to take more into consideration. I don't know why, but we haven't focused that much on it before, maybe we took for granted that of course we have that heritage and it's not something we want to focus on, but actually if we are going abroad it is important we are

part of that history and it makes the brand much more powerful. So it wouldn't make sense to be without it. And finally we have the rational level and it is about more hard core facts related to a product: price, size, durability. We also have three values at that level that is high quality or superior quality, refine and edge of beauty.[193]

It is also considered cozy, with particular attention to the nature

We sold so many chair and it described as very valuable product. We are from time to time looking at the existing collections to make sure it is revitalised, so next year [2012] we are choosing new colours and new woods for the Serie7 chair, and we are actually going out relaunching the chair as wood because it is made of laminated wood, it is the wood that has created the whole shape of the shell of chair(...). In the past, we have tried to cover the grains of the wood which is very complicated and expensive process, and very stupid actually. It was on the beginning, on the '60 the fully covered lacquered.(...) We would like to explain people this is a wood chair and we would like to focus on the natural furniture, they are more long lasting, they get scratches and they get a stemma, but if it is fully lacquered, do you know that? You can't see it is wood, it is only a smooth surface and that if it gets a scratches is looks damaged, but the other one actually becomes more and more beautiful and the wood chair got more character and people like to focus on that stories and also sort of differentiation from the competitors.[194]

Therefore, the Serie7 is described as sustainable because it is using wood instead of plastic material. The wood is coming from certified forests; it is long lasting so there are limited wastes. The standards for the production are high, the company has strengthened the surfaces through new lacquered. It is produced according to the European standards; they meet the requirements for all the different markets (public, schools, and private houses). The Serie7 is also described as classic and timeless, simple, easy to recognise, they are not stealing the attention from the architecture, they are described as having their own character; therefore, they can be displaced in totally different contexts.
The chair is described as democratic, conveying of good values:

[193]Interview with Design Manager
[194]Interview with the Design Manager

> *combined with the new social- democratic politics, modern design could offer the opportunity of an improved life at home and shared prosperity, and to this day the home remains absolutely central to the focus of Scandinavian life.*[195]

The chairs are described as expensive, but not luxury items. The customers that approach the showrooms are customers who are not buying to boast, but those who consider the chairs' high quality; they can have a story that can be told at dinner with the guests.[196] In the developing markets, the Serie7 is considered a luxury furniture, customers are buying because of status reasons, but in Europe and America it is promoted as classical Danish product that are comfortable, of good quality, and have emotional value. The value Danish was described in the different exhibitions were the Serie7 was displaced.
The customers are affectionate to the Serie7, not to Fritz Hansen as a company. When interviewed, they do not know the company's name, but they know that the chair has been designed by Arne Jacobsen.[197] A Danish owner remembered that his chairs were found in the basement years ago, and he re-coloured them.[198] Another customer affirmed that he bought the chairs and then took them to the car-body shop to change the colour

> *because the car body shop could guarantee the same colour over the years. Fritz Hansen could not*[199]

However, these are mostly features associated and framed in Denmark. In the other countries, especially in UK and Italy, the values that were framed were Arne Jacobsen's values, that make the chair a very upper class good among customers.[200] In UK it is associated with Paul Smith, who upholstered with his fabric.

[195](Fay, 2012, pg. 49)
[196]field note in the showrooms in London and Milano
[197]field diary
[198]interview with a customer, 2012
[199]interview with a customer, October 2013
[200]field notes in London and Milano, March, 2013

5.2.6 Conclusions: The Serie7

The Serie7 was analysed in four different episodes: 1) the product development (including row development of the plywood, the creation of the Ant, and the translation of the Ant into the Serie7); 2) the introduction in the market during which the sales were low and many chairs of Arne Jacobsen were produced; 3) the increase of the sales, during which the Serie7 was one of the few chairs produced in the company and was associated with the features of long lasting, high quality, sustainability and made of wood. These features were mobilising both the customers who were sensitive to the environmental issues and promoting the green material, the corporate customers who were willing to have long-lasting assets for their companies; 4) in the last episode, the Serie7 was translated in a high quality chair that is almost a piece of art, interpreted by various artists and mobilised for fundraising events. The Serie7 and the number of times sold are the results of a process of translations, enrolment, mobilisations, and associated features. In the following table, the episodes are summarised.

Table 5.7. Episodes of the Serie7 summary of the empirical study of the Serie7.

	Allies in the network	**Translations, enrolment, mobilisation**	**Spokesperson**	**Features associated and disassociated**
Episode 1- The design of the product 1932-1955	The network is composed of an complex heterogeneous network of humans and non human actors, and it was necessary to divide this episode in three sub episodes, due to the size of the network. The allies are working for the production and development of the plywood.	During this episode the plywood, the material used for the Serie7, was developed and the actor organic design became black boxed. The plywood was developed as handcraft material by Aalto, the Eames developed it to make it bendable and usable at the industrial scale. Søren Hansen took it to Denmark, and together with Fritz Hansen, they developed to make it suitable for the local timber and developed a new technique to make it bendable to manufacture a chair with one piece of wood. The first chair made of one piece, the Ant, was developed in FH, using this material and technique, translated into the Serie7 because of the complaints from the customers	Eames for the development of plywood in USA; Søren and Fritz Hansen for the development of the plywood in DK. Arne Jacobsen was macro-actor, the designer that represented the allies involved in the design of the chairs	The spokespersons worked for associating features that represented the industrial production, the production of organic furniture at a lower price for each item because of the high volumes; the furnitures, are organic and functional. These features are disassociated from the features that represented the previous furniture, which was ornamental, cabinet-maker production, with high price and low volume of production

Continued on next page

	Allies in the network	Translations, enrolment, mobilisation	spokesperson	Features associated and disassociated
Episode 2: The Long Introduction in the Market (1955-1975)	The allies in the network change compered to the previous episode. Some are transformed (the material is black boxed), other appear, like the new chairs made which are made of the same material of the Serie7 and the Ant, but with different shapes. New actors mobilised to displace the chairs (exhibitions, prizes, new buildings, favourable exchange rate that increased the profits) and other that are creating struggles (design infringement, copies)	The Serie7 was translated into the representative of the Danish Design. Because of the plant's enlargement and the high sales of the Ant and Serie7, the increase of the export, Hansen and Jacobsen designed and produced new chairs using the same industrial technique	Søren Hansen; Arne Jacobsen is the macro-actor representing the actors involved in the design of the chairs and their mobilisation to architect meetings	The features associated were aimed framing the chair as original, representing the Danish design, mass produced and industrially made, which ensured high quality of the chairs, and the Søren Hansen was working to disassociate from being cabinetmaker and a copy.
Episode 3: the increase in the sales (1975-1982)	New actors emerged, and they were destabilising the network of Fritz Hansen (the oil prices, the economic crisis, the pollution caused by the industry, petrol and plastic materials). Peter Lassen enrolled these actors in the network of the Serie7, and they contributed to make it stronger and increase the sales	Peter Lassen initiated the translation of the Serie7 as Danish design, a chair of good quality that is sustainable, resistant and suitable in different markets (Europe/ USA/ Middle East)	Peter Lassen	Peter Lassen worked for associating features that framed the chair as sustainable, environmental friendly for the material used and because, being resistant, it could last for many years. Therefore, he worked to disassociate the features related to pollution, plastic material and not resistant chair

Continued on next page

	Allies in the network	Translations, enrolment, mobilisation	spokesperson	Features associated and dis-associated
Episode 4: The decline of the Serie7 (2002-2013)	The network in this episode is more fragile, there are emerging actors that create struggles for the network (the new factory in Poland and the closure of the factory in Lillerød, the high prices), and others that worked to sustain it (the museums' exhibitions, the work of the furniture dealers, the articles in the magazines)	The Serie7 was translated from being a well known chair, suitable for any use, to a high end classical Scandinavian design, through the creation of the Republic of FH, the work of the artists, and the exhibitions	Jacob Holm	Jacob Holm worked to promote the features of being a chair designed by Arne Jacobsen, with the features of being a quality chair, environmental friendly, Scandinavian, iconic, for private customers and not for a mass market.

The theoretical implications of the analysis will be discussed in the conclusion of this chapter, with a cross-case summary, and expanded in Chapter 6.

5.3 Egg Chair

The following figure represents the product life cycle of the Egg. In the figure, the episodes that are analysed are indicated.

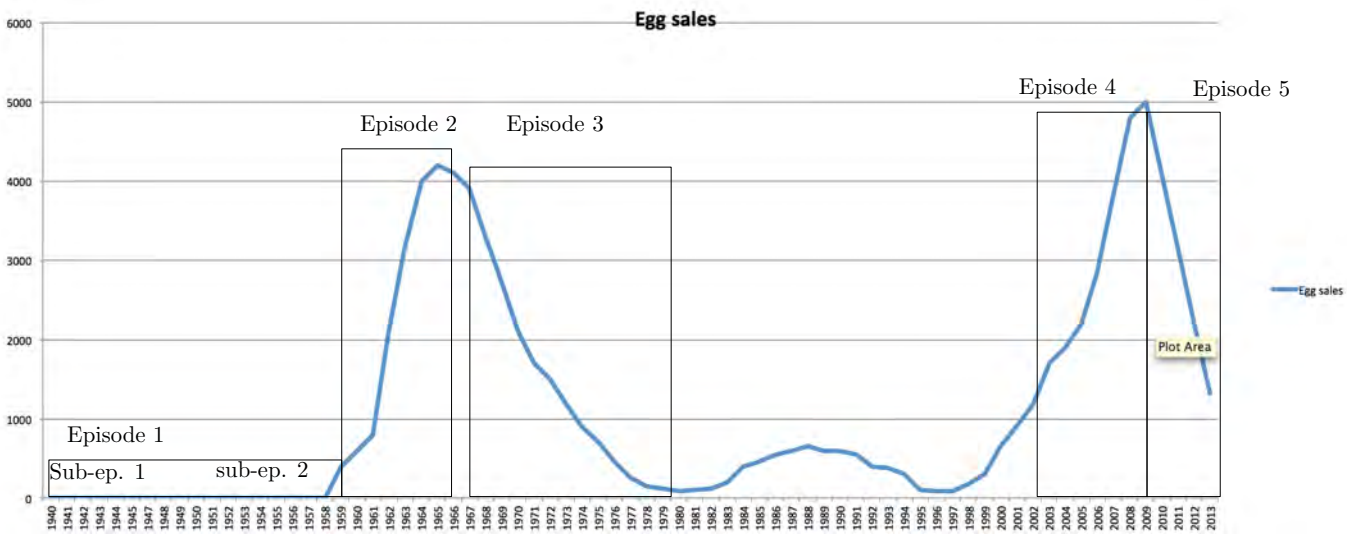

Figure 5.21. PLC of the Egg and episodes analysed and two pictures of the Egg.

The Egg is a foam manufactured by Fritz Hansen Company and introduced in the market in 1958[201]. The Egg is the result of the willingness of Arne Jacobsen and Søren Hansen to experiment with new materials created during the war and to foster the industrial manufacturing of chairs.

[201] see appendix for the pictures and documents

5.3.1 Episode 1: The design of the Egg (1945-1958)

The analysis of this episode is focused on the periods preceding the presentation of the Egg, a lounge chair manufactured by Fritz Hansen, introduced at the "Salon des arts menageries" in Paris in 1959.[202] It is made of foam flakes, covered by fabric and sustained by an aluminium foot. The following figure shows the the allies enrolled and their relationships in the development of the Egg.

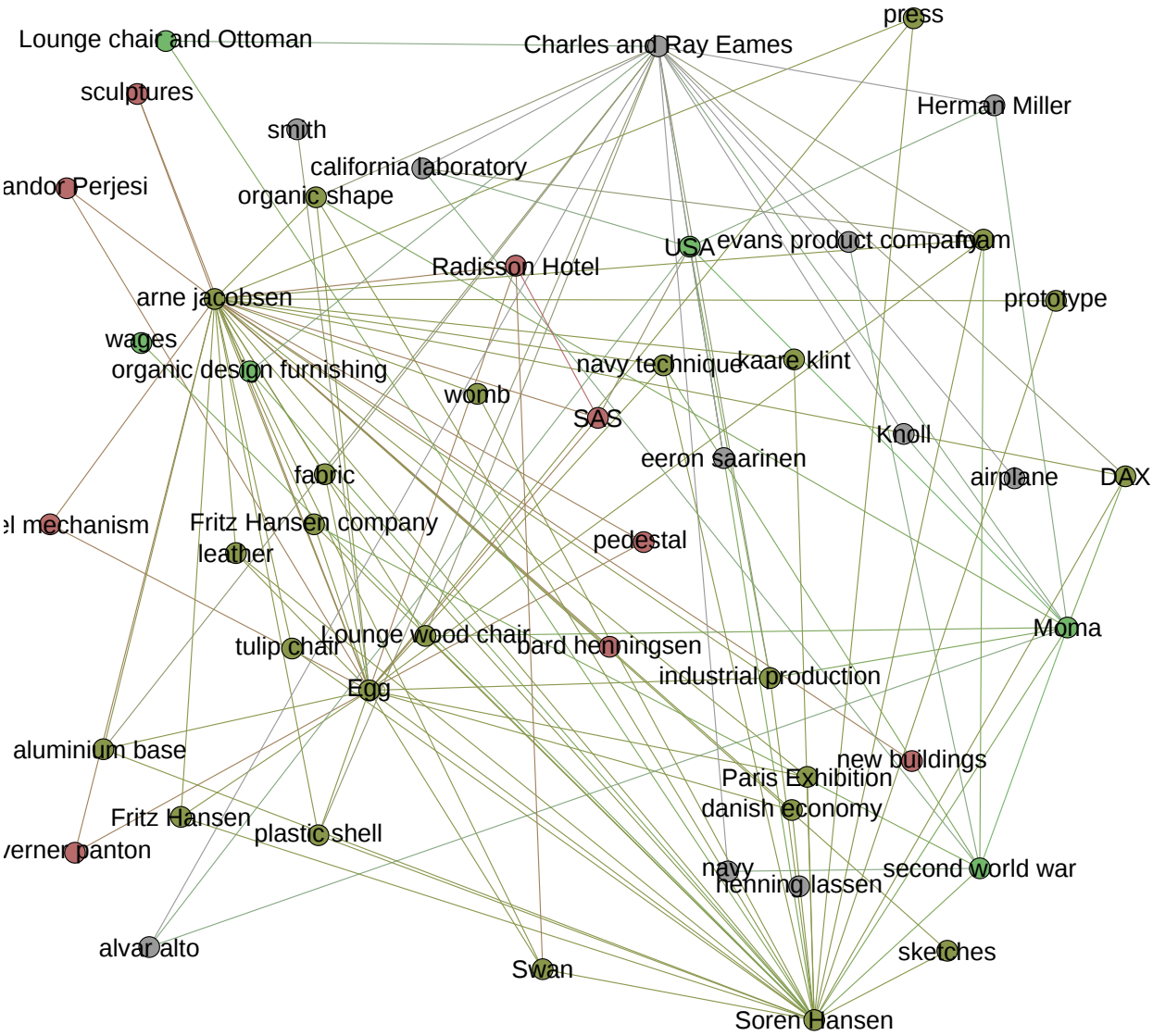

Figure 5.22. Allies in the network, first episode. Network showing the allies enrolled and their relationships in the development of the Egg Chair.

Due to the size of the network, this episode has been divided into two sub-episodes presented in chronological order:

[202] cat_378:Dansk succes, Dagens Nyheder, 29 marts, 1961

- 1940-1949: the episode in which the fiberglass, the material used for the Egg, was developed and the actor organic design became black boxed;
- 1955-1958: the episode in which the Egg was and manufactured by Fritz Hansen

5.3.1.1 The development of the Styropor

Allies in the network The following table represents the allies in the network that supported the development of the Egg Chair.

American government	American Army	Charles and Ray Eames	Chrysler patent
DAX	Eeron Saarinen	Fiberglass	Foam
Fashion magazines	Herman Miller company	Knoll furniture company	lrv Green
Laboratory of Eames	MoMA	Newspaper articles	Milt Brucker
Museum design project	Navy	New York	Norwegian Engineer
Organic design	Prothesis for the soldiers	Refugees	Second World War
Styripor	Sol Fingerhut	Tulip Chair	Womb Chair
Upholstering technique	University of California	Winter	Zenith Plastics

Table 5.7. Allies and black boxes in the network of the Egg, first episode. The allies in the network in blue are human allies, the red ones are non-human allies and the black one is a black box.

Translations, mobilisation, enrolment The following figure represents the translations that led to the development of the Egg chair. Fritz and Søren Hansen were mobilised by the industrial manufacturing, and both of them with Arne Jacobsen were enrolled by the Eames' and Saarinen' chairs that mediated the access to the foam and of the black box organic design.

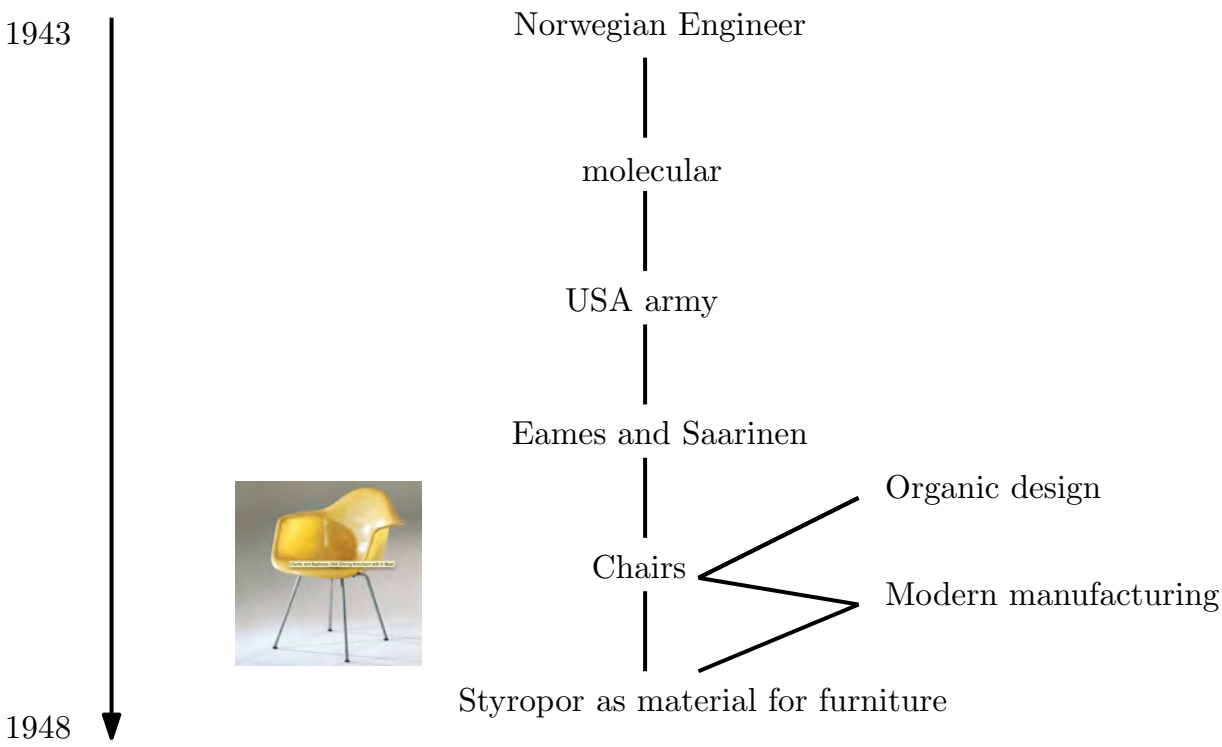

Figure 5.23. Translations, first episode. Overview of translations initiated by the Norwegian engineer that invented the Styropor and that the material went through from being used as war material in the navy to be used in industrial design, making modern manufacturing of chairs possible.

The material, the Styropor, was invented by a Norwegian engineer before the Second World War; the characteristics of this material were widely explored during the war by the American navy, which bought the patent to increase the resistance of shells. Eames and Saarinen were the first to mobilise this material in the furniture industry. After the war, they acquired the patent to experiment with this material to look for uses in the furniture industry, to produce industrially manufactured chairs. The first chair that was designed by the Eames was the DAX. The DAX was realised for an international competition announced by the Museum of Modern Art in New York and the Museum Design Project, a non-commercial association of furniture producers and retailers. The international competition was entitled "Low-Cost Furniture Design" and announced on the 5th of January 1948[203], [204] The goal of the exhibition was to find interesting solutions for realising cheap furnitures that could be manufactured at industrial scale. Charles and Ray Eames participated with DAX and the Chaise. For the design of the DAX chair, the Eames worked with engineers at the University of California in Los Angeles, producing several aluminium prototypes, but they were diffi-

[203]http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/tulip-chair-no-151-saarinen.html on the 21st of October, 2013
[204]Sembach (1997)

cult to realise because the provisional moulded forms were bursted. However, they managed to fix the problem after many trials, and they realised a chair made of foam.[205] The chair was judged second by the jury at the competition, for the aesthetic value and because it was suitable for mass production, and the material could also be used in the automobile industry. The exhibition mobilised some engineers who worked with the material: lrv Green, Sol Fingerhut and Milt Brucker, working at Zenith Plastics, presented their fibreglass process at the Eames' studio.[206] Their technology was developed during the war for radar housing on the noses of airplanes. The Eames implemented the material on the chair designed for the competition, and they realised in cooperation with the Herman Miller Furniture Company, the first series of 2000 armchair shells with a patent for welded-on shock mounts developed by Chrysler to mount the shell-shaped seats dyed in different colours on different bases without having to alter the shell.[207] [208]
After this chair, the Eames designed La Chaise for Herman Miller, fitting the programme of action of the American Government: developing cheap and mass market chairs for the refugees of the of the Second World War, who were migrating in USA. After the War, there was a shortage of housing in the United States and a limited selection of low-priced, space-saving furniture available on the market. La Chaise consisted of two very thin fibreglass shells glued together and separated by a hard rubber disk; the resulting cavity was filled with styrene, and the base was made of five metal rods in a partly diagonal arrangement that was set into a construction of intersecting pieces of wood.[209] Also, Eero Saarinen was mobilised by the polyester, enrolled and interested in the network of the material. He decided to translate a chair designed with Charles Eames that won the first price for the competition at MoMA for organic design made of plywood,[210] into a plastic chair to be produced in large quantities,[211] Saarinen argued that the new material was more suitable than laminated wood for shaping even complicated curves and moulds. They decided to look for a carpenter to mould the prototype, since the polyester did not have a structure of its own. During the search for a

[205]Raizman (2004)
[206]Raizman (2004)
[207]http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/tulip-chair-no-151-saarinen.html on the 21st of October, 2013,
[208]Sembach (1997)
[209]http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/tulip-chair-no-151-saarinen.html on the 21st of October, 2013
[210]see sub-episode 1 of the Serie7
[211]http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/tulip-chair-no-151-saarinen.html on the 21st of October, 2013, and information collected at the Victoria and Albert Museum

carpenter able to work this material for building the model, Saarinen and Eames discovered a shipbuilder in New Jersey named Winter who worked with fiberglass.[212] The three persons, supported by Knoll, were able to design the chair. At the end of the process, Saarinen added the latex-foam padding, the loose seat and the back cushions to increase the comfort.[213] After the successful realisation and the good market reception of the chair, Saarinen designed the Tulip Chair and Knoll accepted to manufacture it. The characteristic feature of the series is that the supporting structure has been pared to a central supporting stem "like a wineglass" in order to emphasise the uniformity of table and chair. Eero Saarinen, in an interview affirmed:

> *The bases of tables and chairs in a typical furniture arrangement create an ugly, confusing, and restless world. I wanted to design a chair as an integrated whole once again. All important furniture of the past always had a holistic structure, from King Tut's chair to that of Thomas Chippendale. Today, we are parting ways with this holism with our predilection for plastic and laminated wood shells. In current production methods, pedestal furniture is half plastic and half metal. I am looking forward to the point when the plastics industry will be capable of manufacturing the chair using just one material, the way I have designed it.*[214]

Søren Hansen was in USA during the exhibitions and he got interested in the modern design and in the use of the the new material. The chairs mediated the access of the polyester for Søren Hansen and Arne Jacobsen, displaced at the exhibitions and throughout the manufacturing. Søren Hansen bought some of them, brought them back to Denmark and displaced them[215].

Spokespersons The spokespersons for this episode, in which the polyester as furniture material was developed, were Charles Eames and Eero Saarinen (managers at the Plywood company). The spokespersons were supporting the use of the foam in the furniture industry, promoting the conversion of a wartime material into civil use material. After the war, there was an increase in for manufacturing due to the economic boom after the war and the consequent need of having furniture that were possible to be produced at a faster pace.

[212] http://www.design-museum.de on the 21st of October, 2013

[213] http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/tulip-chair-no-151-saarinen.html on the 21st of October, 2013, and information collected at the Victoria and Albert Museum

[214] http://www.design-museum.de, the 21st of October, 2013

[215] interview with the librarian at kunstindustrimuseet

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept and develop the Styropor as material for the furniture industry.

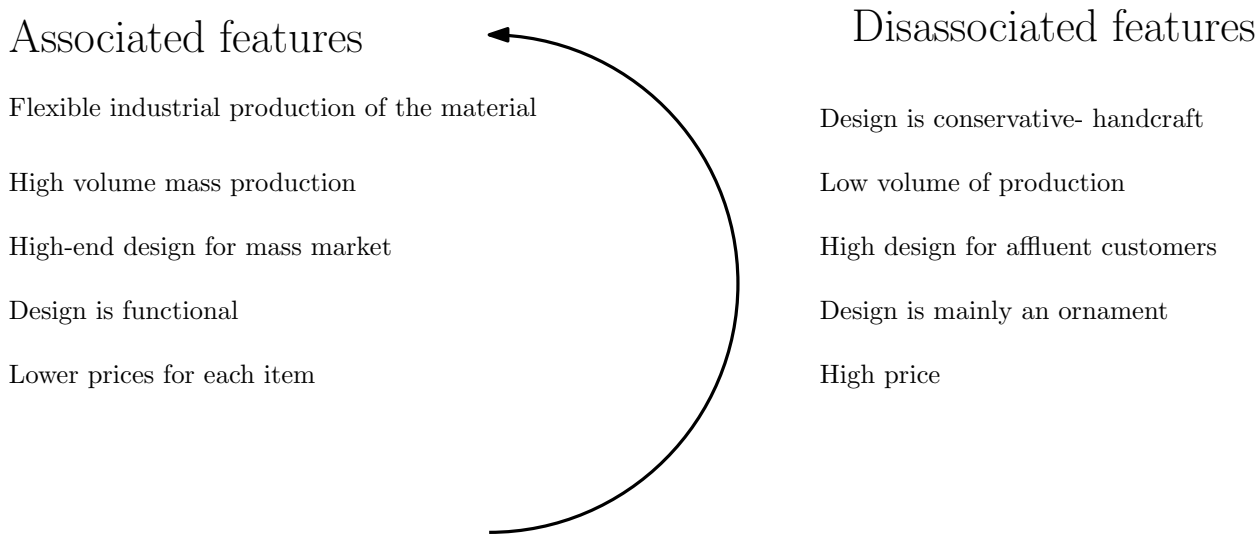

Figure 5.24. Design features as an outcome of choices, first episode; the development of the Styropor. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of adopting (and adapting) the Styropor in the furniture industry, after the Second World War.

The spokespersons worked for and promoted the features of the polyester materials as being flexible for the industrial production, allowing high-volume mass production, and decreasing the price for item, so that design to become an actor for the mass market, not only for few wealthy persons; the design produced using the Styropor was functional. This programme of action reflected the goals displaced by the USA government, which wanted to support the development of the manufacturing productions, finding cheap solutions for the refugees escaping from the war zones and emigrating in USA. The new furniture were not only functional, but also nicely made and affordable design items. This was contrasting the programme of action of actors supporting the design of the end of the 19th Century, which was made of precious wood, it was considered like an art object, handcrafted, produced in small quantities, for wealthy customers that were willing to pay a high price. The spokespersons worked to frame the Styropor also by disassociating from the features associated to the hardwood.

5.3.1.2 1950-1952: Second sub-episode: the development of the Egg

Allies in the network The following table represents the allies in the network that supported the development of the Egg chair, designed by Arne Jacobsen, made of Styropor and manufactured by Fritz Hansen.

Architects associations	Arne Jacobsen	Arne Jacobsen assistants	All the instruments used in the prototyping phase
Bellevue chair	DAX by Eames	Design exhibitions	Economic Growth
Egg shape	Foam	Fritz Hansen	Fritz Hansen Company
Increase of the salary	Mærsk worker	**Organic design**	Paris Exhibition
Press	SAS hotel	Second World War	Swan
Swinging mechanism	Søren Hansen	Tubular metal pedestal	Upholstering technique
Tulip Chair	Sandor Perjesi	Womb chair	Workers in modelling the foam

Table 5.8. Allies and black boxes in the network of the egg chair. The allies in the network in blue are human allies, the red ones are non-human allies and the black one is a black box.

Translations, mobilisation, enrolment The following figure represents the translations that lead to the development of the Egg chair. Fritz and Søren Hansen were mobilised by the increase of the production costs, and enrolled by the Eames's chairs that mediated the access to foam and of the black box organic design. Arne Jacobsen in the '30s developed a chair that had the shape similar to the Swan, but it was made of traditional material and it was considered heavy designed. The shape was translated in the Swan and in the Egg, making it more organic.

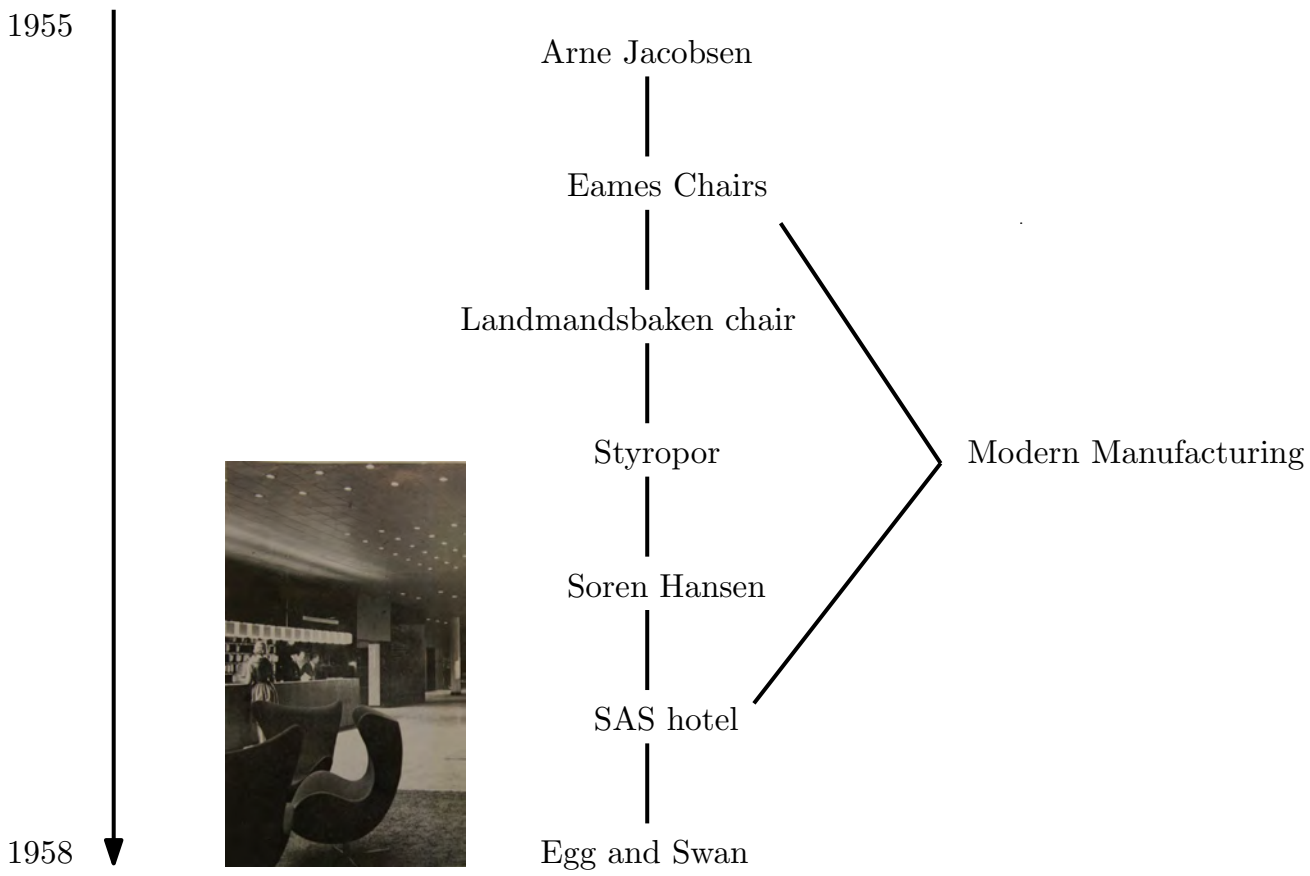

Figure 5.25. Translations. Overview of translations that Arne Jacobsen initiated which brought to the development of the Egg and Swan, based on a chair designed by Arne Jacobsen in the '30s.

Arne Jacobsen won the competition for building the Radisson Hotel (SAS) and he decided to design everything in the hotel, including the chairs.[216] SAS Airplane company promoted the construction of the SAS hotel (Royal Hotel) in Copenhagen. SAS was an airplane company that merged the three Scandinavian Airlines. It opened a new route to New York and Los Angeles (first in Europe), and it was the first company to have a flight to USA through the Nordic Pole. The SAS management decided to build an hotel that could host the persons flying with the SAS. The hotel position was decided to be closed to the train station, so that it could be possible to create an international hub. The architect who won the competition for designing the hotel and its interior was Arne Jacobsen.[217] He was mobilised and enrolled by the Eames and Saarinen's chairs that Søren Hansen brought back from USA.[218] Søren Hansen agreed on supporting the production, if it could have been

[216]Sheridan (2003)
[217]DR documentary
[218]interview with the former designer in Fritz Hansen

industrially manufactured.[219] Since the Egg was destined to the furnishing of the SAS hotel, it would have asked for more pieces: the SAS was a developing company, and it was planning to open different hubs around Europe, possibly maintaining similar furnishing style.[220] As already demonstrated in the American chairs, the new material, the plastic and the foam flakes offered new possibilities for building a lounge chair that was composed only of one piece. Arne Jacobsen continued the design process by sketching the Egg and the Swan with quick sketches and he sent them to those involved (his collaborators and Søren Hansen). The process was a continuous back and forth between the designer, the manufacturer and his studio. After the sketches, Arne Jacobsen made a prototype, and the decisions were made based on the success of the modifications of the prototype.[221]

> *We began to cut things out in the cardboard and work with plaster, always in scale 1:1.*
> *For the first 1/2 years I stood there and with a single chair and put plaster on a filed plaster off. It was like making a sculpture, and Arne Jacobsen took it off to his summer house over the weekend a few times and worked on it further.*[222]

In an interview, Sandor Perjesi, artist assisting Arne Jacobsen in moulding the prototype described the product development process as a sculptural work:

> *I remember the first time we drove to his summer house in Tissø, to work on the Egg, we had put the plaster model into the back of my car, and then the whole week end we added and removed plaster. Back and forth, like classical sculptors. After that, it was with the model of his Herrenhaus project- probably my most outstanding experience with him- and then on Cylinda line, and on the cutlery for the SAS hotel. Everything had to be moulded in plaster. Arne Jacobsen had a very concrete and physical way of working with objects. That does not mean that his idea would not clash with what was physically possible- he would order that a model be sawn apart, in order to take a couple of centimetres off in the middle, not bothering whether the model could be put back together again. In fact, he did just that when the Egg almost finished. I experienced similar things during our work with*

[219] minutes from the meetings
[220] DR documentary: SAS; transmitted on Danish TV in October 2013
[221] Thau and Vindum (1975)
[222] Worker in Fritz Hansen in Thau and Vindum (1975)

the cylinda- line. He wanted the models thinner than was realistically possible, but he insisted. He had such tremendous artistic discipline and energy, fascinating to a young person. He was always very careful that the workshop was clean and tidy. He could work without getting any plaster on himself at all- he was not the type who was covered in plaster when he worked on a model. The architect Fleming Lassen once told me that is was he who convinced Arne Jacobsen to become an architect in the first place. Originally, he wanted to become a sculptor or a painter. That is very illustrative- to me he was a sculpture in his handling of form.[223]

Arne Jacobsen mobilised the characteristics of different chairs and he inscribed the main characteristics in the Egg: the upholstered shells of hard foam were from the organic chairs by Chales Eames and Eero Saarinen; the shape, the form, the characteristic of being a continuous, three-dimensional fibreglass shell padded with foam rubber and upholstered mounted on a tubular steel frame were mobilised in the Saarinen's womb chair (model number 70) from 1948;[224] the organic shape from the Tulip chair by Saarinen, whose fibreglass shell merges wit its pedestal. The enrolment resulted in success by combining the shell of the womb with the pedestal base of the tulip.[225] Søren Hansen and Fritz Hansen worked for the network construction by acquiring the patent of the material and to train people in the factory to be able to work with the new material.
The slender base with swivel axis on a four-part foot metal was translated from a chair of Saarinen. The newspaper at the time of the presentation of the Egg and Swan, enrolled the actors in the network by translating the Egg development process as a creation, which began in a sculptor's workshop, and modelled as a sculpture, with a prototype that followed the model's performance in full-size plaster. This was described as an experimental work, during which Arne Jacobsen used the shipbuilding technique of shaping a hull using frames. For the definition and the levigation of the shell, Arne Jacobsen brought a technology that was proper of the navy. He invited a worker from Mærsk to go to the workshop to levigate the material.

At the presentation it was announced the Egg creation began in a car huggers workshop, where Arne Jacobsen has modelled the egg as a sculptor. Later models have a full-size plaster. In order

[223]Sandor Perjesi in Thau and Vindum (1975)
[224]bk_90,91: books´s picture of the book Thau et al. (2001) from Oxford university' library
[225]bk_90,91,92,93,94: Thau et al. (2001)

to obtain the best sitting position, he used a technique used in ship building industry to mould a hull by means of ribs. The chair is made of plastic, and it is filled with foam flakes, which is moulded into varying thickness. After that, the shell is modelled, and the chair ready. The name is the Egg, it is a wing chair, and the shape is similar to an egg. The Swan is called in that way, because the wings have the same shape of the wings of the swan, and the process is similar to the one of the Egg.[226]

The seat shell was baked from a plastic type material in a mould, then it is covered with a large foam flake cast with varying thickness, upholstered fabric or leather and finally mounted on aluminium leg with four feet, and could be a fixed chair or a swivel chair.[227]
The presentation to the network was received favourably. The press was mobilising the qualities of being comfortable, novel and that it will have a future:

The professor, architect Arne Jacobsen, has designed a new chair, and it will become famous for many different reasons. The first one is Arne Jacobsen reputation as our more intelligent architect. The second one is that he has achieved sales records in Denmark with his last chair, made also this time, almost inevitably, by Fritz Hansen. The factory can cope with the demand of chairs since it has opened a new area in the factory. The third one is that the chair is not called as a regular chair. This is an armchair in two models, with a poetic name "Egg" and "Swan", backed of plastic with a mould form. Arne Jacobsen has modelled the chair as a sculpture. First, he made the model, the prototype, than he created it in plastic with foam flakes. Successively, the chair is covered by the fabric and put a foot of aluminium. The result is exceptional. Comfortable on shoulders and lumbar level, it is made of one piece, and it is a sociable chair because people can talk, and also leave it light as a duvet. The new chair by can be used to move around in the living too with boys of 5 years old. The Egg is a big chair. This is an answer to the classic high back armchair with earflaps, and in two kind that can creep into a snow-filled winter. The Swan is made both with aluminium or

[226]cat_257: stole med form som et æg og arme som svane-vinger; to stole nyskabelser fra Lillerød, tegnet af Professor Arne Jacobsen
[227]cat_252,253,254: to nye Arne Jacobsen-stole, Politiken, 8/1/59

wood legs.[228]

According to an interview made to Bård Henningsen, he reported that Arne Jacobsen was asking anyone to try the prototype and to judge the comfort of the chair.[229] The name of the chairs came from the shape they have.[230] The chairs were weighted 13 and 7 kg; an advantage over the old upholstered chairs since similar chairs in wood were heavier. Other articles[231] were describing the presentation of the Egg and the Swam as an exceptional episode, since it was an innovation in terms of design forms, material, a combination of art and technical features. For the upholstering, the Lounge Chair and the Ottoman were mobilised. The Lounge chair and Ottoman were designed by Charles Eames in cooperation with Eero Saarinen in 1940, after the New York MoMA's "Organic Design in Home Furnishings" competition. The design was based on the armchair exhibited at MomA made of a single piece plywood for the seat and for the back. The plywood shells, bent two-dimensionally for the shoulders, back, seat, and ottoman were veneered in the early version with rosewood and later with walnut or rosewood. The leather upholstery was removable. The back sections of the seat and the back support are held together by two cast aluminium supports and hard rubber discs, the armrests provide the only connection of the back with the shell and feature washers made of Neoprene. The chair can be rotated on the star-base, but its individual elements are firmly connected to each other. Also worth mentioning are the high-grade materials; even the aluminium is enhanced by expensive finishing on the polished outer side and blackened side parts. In 1957, it was awarded first prize at the Triennial in Milan. It was produced by Miller.[232] The presentation of the Egg was in November 1958 at the Formes Scandinaves exhibition at Musee des Arts Decoratifs in Paris, where the Egg and the Swan were presented as part of the interior for the SAS Royal Hotel. In a 1958 article in the Danish newspaper, Politiken, a headline referring to the Formes Scandinaves exhibition read: "The French press is astonished by Danish Design." Other furniture fairs, which all helped to draw attention to the new creation, followed the exhibition in Paris.[233]After the presentation, Søren Hansen added a swinging mechanism to increase the comfort of

[228]cat_287:Ægget skabelse i bagt plastic, Politiken, 8/1/1959

[229]Thau and Vindum (1975)

[230]cat_280: Arne Jacobsen har bagt en "Svane" or et "æg", Socialdemokraten, 7/1/59

[231]cat_252,253,254

[232]http://www.design-museum.de/en/collection/100-masterpieces/detailseiten/tulip-chair-no-151-saarinen.html on the 21st of October, 2013

[233]Christiansen et al. (2010)

the chair; since it did not change the design, Arne Jacobsen accepted it.[234] After the resonation of the Egg, the Swan was introduced to the press. The Swan's form was related to Jacobsen's own upholstered chairs form 1930s, the chair that was used to furnish branch offices for the Landmandsbaken; this chair was translated in the Swan by modifying the shell, making it entire and continuous.[235]

Spokespersons The identified spokespersons are Søren Hansen and Fritz Hansen. Arne Jacobsen was a macro-actor that represented his studio, the drawings, and all the other actors that were mobilised for realising the chairs for the SAS hotel. He pushed the design to the limits by doing the chairs only in one piece, Søren Hansen and his brother supported and technically helped in the designing of the chairs without any constraint in terms of manufacturing: the manufacture process should adapt to the idea of the architects, not vice-versa.[236] Fritz Hansen (machine engineer and manager of the production department), worked actively to find the appropriate machine, the patent for the foam and the adequate manufacturing technique to make the production of the Egg possible;[237] Arne Jacobsen mobilised the reputation he built with the Ant chair and with the Serie7 to position the Egg chair.[238]

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to buy the Egg as sustainable design chair.

[234] cat_290: Politiken, 9/1/59
[235] bk_90: Thau et al. (2001)
[236] cat_field note, informal talk with the employees in Allerød, working in the production
[237] korte træk af en lang historien
[238] Una serie di mobili di Arne Jacobsen, rivista dell'arradamento, Gennaio 1959

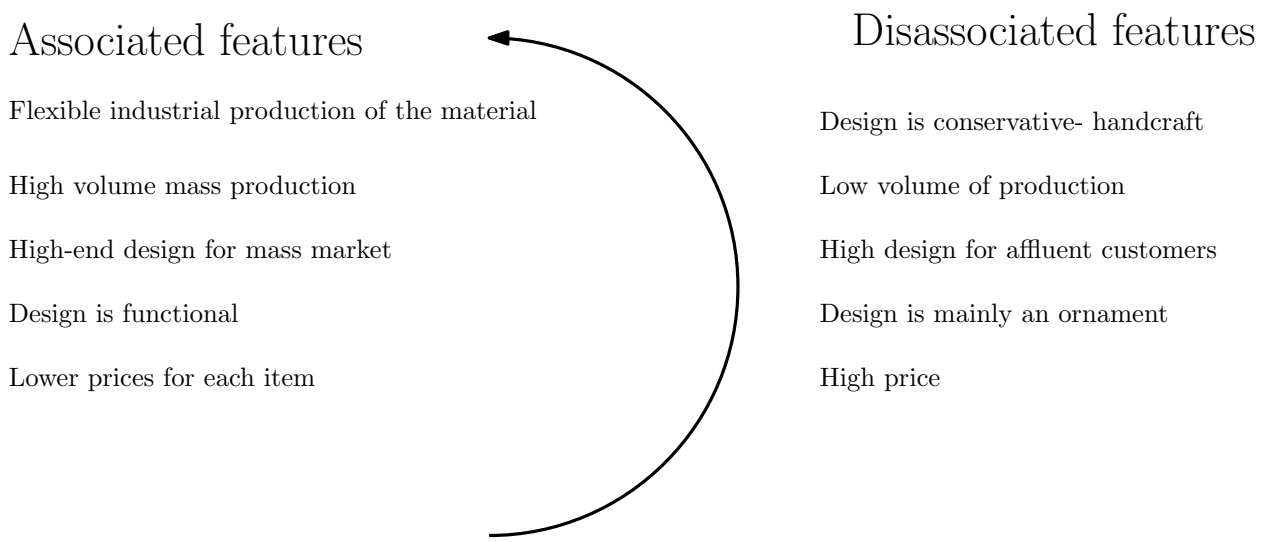

Figure 5.26. Design features as an outcome of choices. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the program of action of adopting the Egg.

The material used (aluminium, plastic, foam flake) framed the press that attached features of innovativeness and lightweight to it.) [239]
The press contributed to frame the actors in the network.
Arne Jacobsen and Søren Hansen communicated to the press that the Egg chair was associated with the features of being modern, [240] comfort suitable for relaxing, talking, smoking pipe,[241] both sturdy, and lightweight.[242] The press described the egg as backed from a sculpture, and they are attaching the quality of innovation and novelty:

> *Is it really possible to find a new chair? Yes, it is! The new chairs designed by the professor Arne Jacobsen for the manufacture Fritz Hansen. And those innovations it is not only in terms of design, but also in the material and in the technique of production. At Fritz Hansen has been the view that the development will be stopped if the form's action is dictated by the exciting machinery. Why do you give the artist a free hand and endeavour then to align the technical apparatus in a rational production. The new chair of Arne Jacobsen is called the Egg and the Swan with foam and covered. The chair is mounted in the foot of aluminium*

[239] cat_248: og så "bager" vi en hyggestol til far, Berlineske tidende, 8/1/59
[240] cat_126: Dans l'art du meuble c'est du nord que vient la lumiere
[241] cat_126; cat_127_128_129_130_131_132: 900 udstillere på Kølns møbelmesse, Politiken, 11/2/1960; Politiken, 1959
[242] Articles from the Politiken

and coved with leather or fabric, and it is very light, circa 13 kg and 7 kg, so there are no problems in moving them around.[243]

The chair was featured also as strong and resistant,[244] suitable for an industrial production process. The Press was very positive about the chair, and it described the Egg as a novel and futuristic chair that is lightweight and poetic.[245] Soren Hansen and Fritz Hansen were framing the industrial value, Soren Hansen described the chair in the interview as ultramodern, enjoyable, comfortable thanks to the tiling mechanism, the Egg is neither traditional chair nor a cabinet maker. When it was presented, the newspapers qualified the chair as lightweight and innovative. These were the adjectives that were used to qualify the chair and benchmark with the other chairs.

5.3.2 Conclusions of the first episode: the design of the Egg

The first episode is divided into two sub-episodes. In the first one, the Styropor was developed as new material for the modern manufacture industry. In the second one, the Egg and the Swan were designed. The Styopor was developed by a Norwegian engineer, who immigrated to America and the material was used there for military purposes during the Second World War. The material was used by the Eames and later brought to Denmark by Søren Hansen. It was mobilised and presented to Arne Jacobsen by enrolling the Eames Chairs. It was used by Arne Jacobsen and the Hansens to create the chairs for the SAS hotel, mobilising the chairs of Landmandsbaken.

[243] cat_260: Dansk Arleyde february 1959

[244] cat_258: Arne Jacobsen har bagt en“Svane” go et “Æg”

[245] field notes from the museum in Allerød

5.3.3 Episode 2: The introduction of the Egg in the market (1959-1965)

The analysis of this episode is focused on the periods following the introduction of the Egg in Paris in 1958. This figure displays the enrolment process that took place in a period of six years. In this network, some of the actors emerged in the previous episode are black boxed, some are leaky black boxes (because the actors struggled to close totally), some actors have left the network, others have joined.

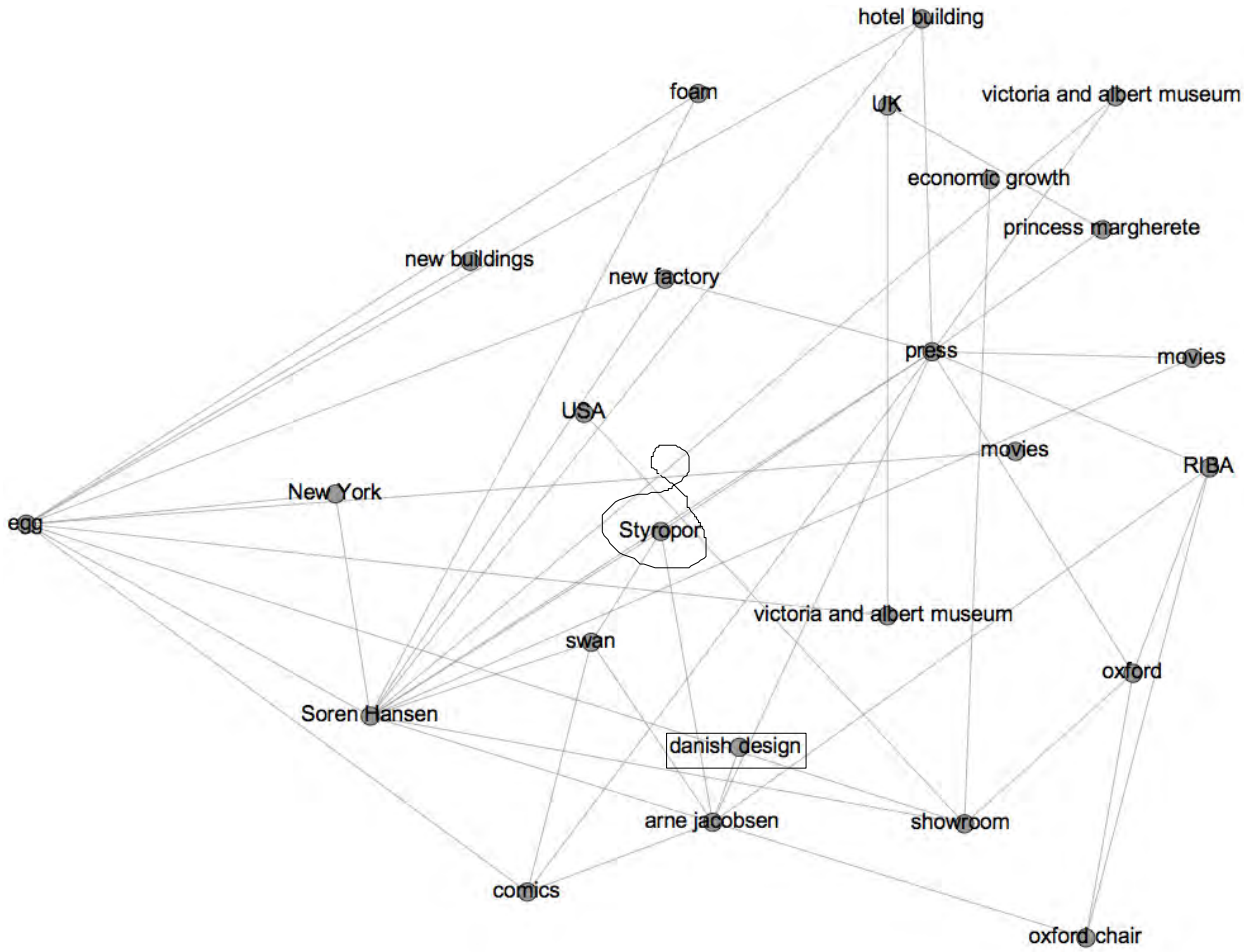

Figure 5.27. Allies in the network in the second episode. Network showing the allies enrolled and their relationships in the period following the introduction of the Egg in the market, covering a period of six years.

Allies in the network The following table represents the allies in the network that supported the introduction of the Egg.

Ant Chair	Advertisement pictures	Architects associations	Arne Jacobsen
Comics	Colours by Arne Jacobsen	Den Permanente	Denmark
Danish Design	Danish kr	Design awards	Design exhibition
Economy	Exchange rate	Foam	Economic growth
Fritz Hansen Company	Hotel Rooms and Lobbies	Leather	Libraries
Movies	Mobilia Club	New factory	New warehouses
Newspaper articles	Offices	**Organic design**	Oxford
Princess Margherete	Press articles	Riba	*styropor*
Saint Catherine College	Swan	Showrooms	Søren Hansen
Tubular metal pedestal	UK	Victoria and Albert museum	All the machines use for producing the chairs

Table 5.9. Allies and black boxes in the network of the Egg chair during the second episode. The allies in the network in blue are human allies, the red ones are non human allies, the black one is a black box, and the one in italics is a leaky black box.

Translations, mobilisation, enrolment

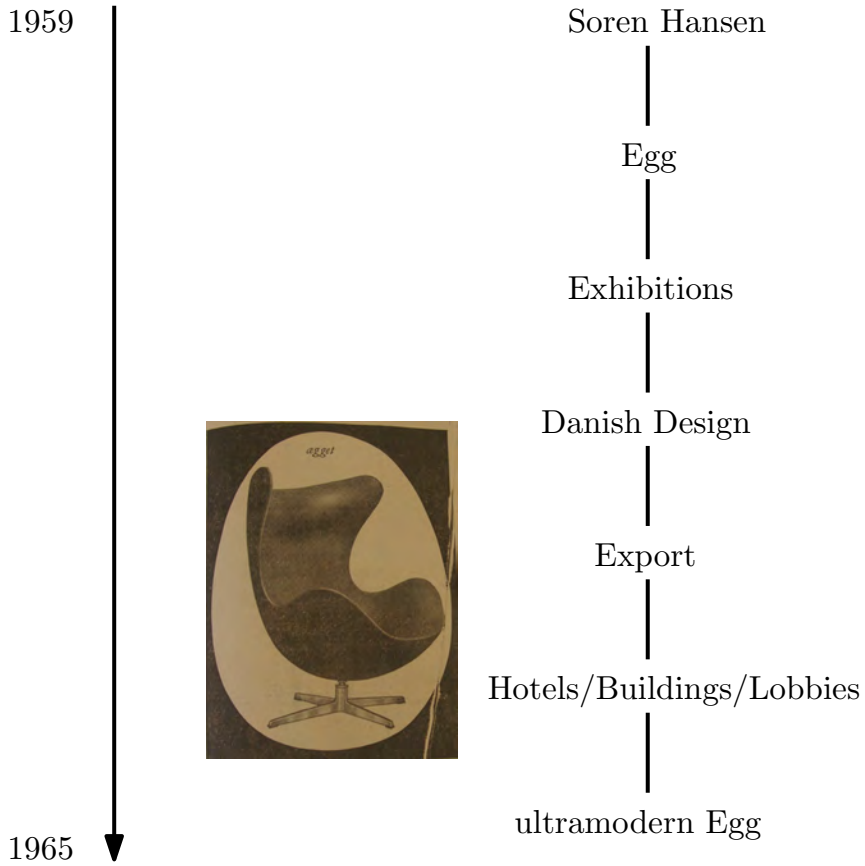

Figure 5.28. Translations during the second episode. Overview of translations Søren Hansen initiated to translate the Egg into an ultramodern lounge chair.

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Arne Jacobsen was a strong actor in the network; after the success of the Ant of the Serie7, he could mobilise them to get the press interested in his work. He convinced the resistant actors in the network to believe in his trials and in his design. As the line of the newspaper cited

> *The egg is immediately recognised as chair designed by Arne Jacobsen, together with the Serie7 and the Swan.*[246]

After the development of the chairs in the previous years, the actor Danish Design started to be not questioned anymore, and the actors were acting upon the defined characteristics and actors were acting upon it. The Egg and the Swan were presented in many exhibitions and fairs as Danish design and they received much success. However, the Egg was displaced from many exhibitions all around the world (Paris, Amsterdam, Switzerland, Califor-

[246] cat_134: arkitekt.1961

nia, New York),[247] [248] [249] because the Egg as the Swam were lightweight contributed to the stabilisation of the chairs and their acceptance. In one newspaper, under the headlines "The athlete professor," there was the picture of Arne Jacobsen with a Swan in his hands, demonstrating how light weight it was. The chair had been exhibited to the international furniture exhibition, and it was written in the description that the chair's seat and backrest were made from casting a plastic substance, covered with foam and covered in leather or upholstery fabric, supported by a foot of aluminium; the chairs were weighting only 13 and 7 kg (the egg and the swam, respectively), an advantage over the old upholstered chairs in wood were weighting 9-10 kg.[250] They were described as a variation of the same theme, and some journalists were comparing with the Eames and Saarinen chairs, especially, the idea of the soft body being lifted by a slender base with swivel axis on a four-part foot metal, and the chair by Charles Eames could be recalled in this design and in the use of an aluminium foot.[251] The introduction of the chair was perceived as a success, and critics were forecasting great attention and sales increased both in the local and in the international market. In 1959, the newspaper Social-Democrats announced that the chair that the professor Arne Jacobsen as modelled as a sculpture, with the foot in aluminium, made of plastic with foam flakes, had already received the orders for 10 chairs for a restaurant in Johannesburg, 60 for the embassy in Tunisi, 200 for an university in Bruxelles, 350 for the Washington Water Distribution Company, 300 to the cultural centre in Rejkjavik, 400 for a cafe in Milano, 3000 for an institution in west Germany, [252] plus some requests from the SAS offices in Budapest, Geneva, Madrid and Tokyo.[253] Arne Jacobsen was invited to the Royal Institute of British Architects (RIBA) to show his design and furniture. This was the first time that a foreigner architect was participating in the event. It was received favourably by the most, but the most conservative architects were against this invitation and they created also satirical images. Some even questioned the need of hiring a foreigner designer for the construction of a college in Oxford, because UK had many good architects.[254] The Serie7 and the Eggs, despite the criticisms, were exhibited in the exhibition at the Victoria and Albert museum, and this contributed to bring more allies

[247] cat_573:Dansk mad og kunsthåndværk til Seattle: Politiken, 5/12/61
[248] Arne Jacobsen i Paris, Berlingske Tidende, 23 Juli, 1961
[249] 23. udstilling i det dansk hus: Dagens Nyheder 24/7/ 1961
[250] cat_249: Æg og Svane, Dagen Nyehder, 8/1/196
[251] cat_249: Æg og Svane, Dagen Nyehder, 8/1/1961
[252] cat_255e Årets nye stole; Social-demokrat 9/1/59
[253] cat_257: tre værelser til en halv times en prinsesse hvil, Extra-Blandet; 2/6/ 1960
[254] material collected in Oxford, from the memories of Lord Bullock

in the network. Export success of Danish furniture was mainly caused by a deep knowledge of their quality of material among the sellers, the reliability of Fritz Hansen for daily operations, but also acknowledging the presence of a factor of equal importance within industrial design: the aesthetic quality.[255] After the launch of the Egg, a new factory was opened, covering almost 6000 square meters, planned by the royal building inspector, architect and professor Preben Hansen, and by plant engineer Hans Engholm.[256] Owners Fritz and Søren Hansen presented the factory by convening a conference with the press, and showing the factory to the journalists, explaining that 400 people were employed, and the number remained stable even with a major increase in automation of the production.[257]
The Egg was becoming an icon of Denmark, and this feature was exemplified by the present made by the Royal Family to a British Lord: Princess Margarete, when she met Lord Snowden in Cambridge, presented him a leather Egg, designed by Arne Jacobsen, very well-known designer in UK. The Lord commented "ooohhh lovely".[258]
Hansen was also the man to open the door to the American market. This decision played a key role in the initial success of the Egg. Furthermore, to displace the chair and it features, he was giving speeches and organising events in the many universities and museums in USA and Europe. In October 1960, there was a picture for the advertisement of the Egg in the New York Times. There is a typical Danish landscape with soft hills, with a family. The mother was cooking, the son was riding his bicycle, and the father was sitting in the Egg and comfortably reading his newspaper. An article in the Chicago Daily Tribune from February 23, 1961, had the headline "Artistry in Danish Modern," illustrated with a picture of a rococo chair opposite to the Egg. Another picture had the line: "you don't have to choose anymore between aching your legs and aching your vanity".[259] The Egg was also described as ideal for the modern housewives. Sometimes it received some criticism like that the chair was uncomfortable, strange, and too much individualistic (it was not possible to sit in two).[260] However, Arne Jacobsen answered affirming that

> *The chairs are cheaper than conventional upholstered or leather-covered moulded of wood. You are talking with an experienced*

[255] cat_620: Aktuelt newspaper
[256] from the minutes of the meetings
[257] cat_620: dans Arleyde February 1959
[258] cat_64e:Prinsessen tralve dag. Dagens
[259] cat_30: Femina
[260] cat_286: Dejlig hjemmebagt plastic fra professorens kogebog- 9 Jan 1959; Danmark Avisudklip

man. I have tried them with this in mind (also with his wife on his legs) at home it happens naturally, and both partners sit very comfortably. There is even the possibility for the chairs to rotate about, so if husband and wife get into a fight, they can turn backs against together. Another choice is that people have their own chair, so the spouses can be good friends again. The two chairs in from of each other and talk comfortably. The chair is not just nice to sit on, but it is also done in such a good material that is very easy to move for cleaning.[261]

But not everybody agreed. The Egg even made its way into a Flintstone comic strip, in which Barney showed off his new Egg chair to Fred, who did not like it, because it is uncomfortable. Anecdotal evidence said that Vice President Lyndon Johnson also found the Egg uncomfortable when staying at the SAS Royal Hotel in 1963,[262] and he asked to change all the furniture in his room. Arne Jacobsen commented by saying that it might be that the Americans had different tastes. Nevertheless, it was displaced in USA, and it became part of an exhibition that had a good resonance in terms of public and critics, according to the Danish press.

The first time of the plastic shells at the metropolitan museum, in New York. The metropolitan museum has bought 20 pieces from Denmark to exhibit in order to create a permanent section of art of Denmark. These includes furniture, ceramic, gold jewellery and tableware in order to build an exhibition of what is typical Danish the bought items will be exhibited until his exhibition ends. So they will be stored in the museum store to occasionally appearing metropolitans showcase. In connection with the purchase made museum director a statement to the press, which, inter alia, stated: "like the old Greek and Italian renaissance art distinguish the Danish not between the fine arts and handmade and industry". It serves to explain their leadership and global influence and this is why they enter in the metropolitan museum. The pieces that are exhibited are: Finn Julh (sofa of teak and leather; conference table with maple plate and teak legs, and a bowl for the salad in teak), Hans Wegner (a chair) Arne Jacobsen (egg) Magnus Stephensen (porcelains) Jens Ouistgaard , Kristian Vedel Nathalie Krebs, Edith Sonne Bruun, Eva Stær- Nilese,

[261] cat_286:Dejlig hjemmebagt plastic fra professorens kogebog- 9 Jan 1959; Danmarks Avisudklip
[262] cat_1: Aktuelt; 31-8-63

Niles Refsgaard, Lisa Engquist, Anni Jeppesen (ceramic)[263]

The plastic material was an actor that was mobilising the network. The furniture designer and architect Erik Larsen affirmed that the Egg and the plastic material would leave a mark on the future, when the man would experiment with the new materials. The plastic material was considered to have the advantages over tree, one is not bound by the construction[264]. The Egg was also used also in Hollywood movies. [265]

Spokesperson Søren Hansen was the spokesperson of this period, because he was actively speaking on behalf of the chairs and his company, organising events where they could be displaced, organising activities and he actively interacted, negotiated to give shape to the project and to transform it until a market was built (Akrich et al., 2002b, pg. 217). Arne Jacobsen was a macro-actor, because he represented a series of goals and steps and intentions from his studio to make the chairs circulating.

Features associated and features disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network for buying the Egg as design chair.

[263]cat_388:Første plasticskaale paa Metropolitan Museum: Information 28/12/1960

[264]cat_16,17,18,19Møbler som vi ikke havde drømt om for ti aar siden:Hobro Dagblad December 1963

[265]Politiken, 30/12/60

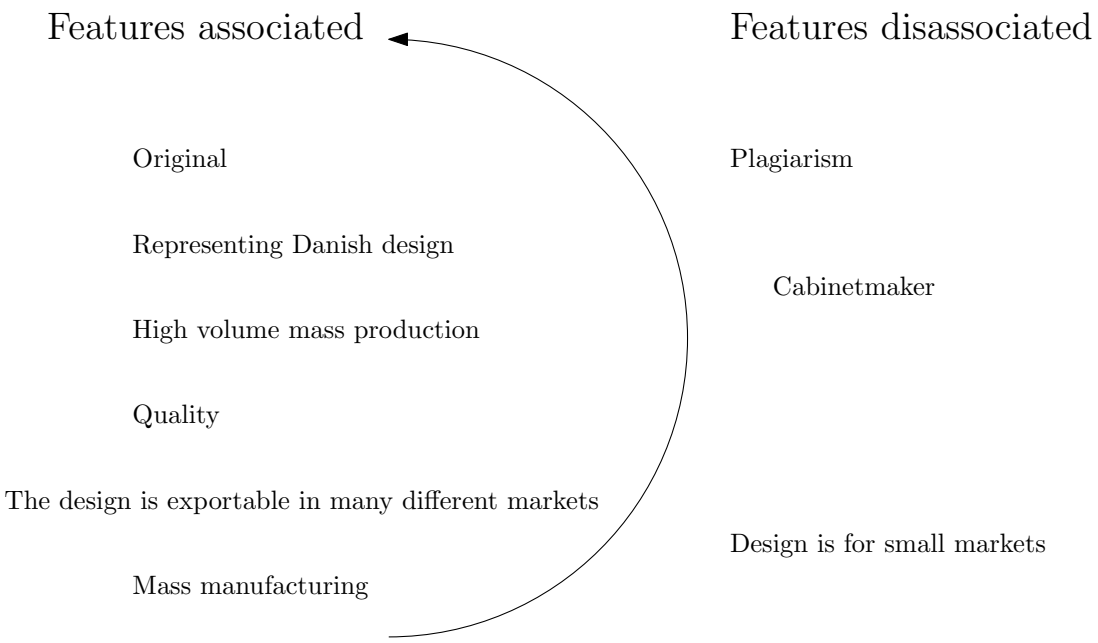

Figure 5.29. Design features as an outcome of choices in the second episode. Representation of the process of inclusion and exclusion of the features that the spokesperson worked for and against to support the programme of action for adopting the Egg.

The Egg was valued by the different framing devices as the "Furniture like we have not dreamt about for 10 years", made of a material that could give new opportunities in the furniture industry, a completely new shoot for the old traditional furniture tradition's strain.[266] Considering the associated features promoted by the spokesperson, the press was describing the chair as comfortable, long lasting, modern, ages well, rational dreaming furniture, coloured upholstery fabric, and it was also described that the chair having a quiet nature also made nicer the environments at home.[267]The chair was described as open to the outside world,[268] a bit uncomfortable without the upholstering,[269] but generally it was described by the newspapers as a place where men could seat, read, smoke, feel comfortable.[270] It was also describing as an ultramodern furniture,[271], expensive,[272] intimate, for everyone, expressive, that also allowed people to be in isolation and had moments of privacy and intimacy.[273] With functional forms,[274] the chair was adapted

[266]cat_16,17,18,19: Møbler som vi ikke havde drømt om for ti aar siden:Hobro Dagblad December 1963
[267]cat_8: Kunst og Håndværk; politiken 11/2/64
[268]Aktuelt 31/8/63
[269]Politiken 20/6/62
[270]cat_252f: Arne Jacobsen- Stole; posten 12/1/1959
[271]cat_8: Kunst og Håndværk; politiken 11/2/64
[272]cat_16,17,18,19: Møbler som vi ikke havde drømt om for ti aar siden:Hobro Dagblad December 1963
[273]film und frau, December 1963
[274]Se og høre n3 1964

to be used for relaxing in the free time.[275] It was also featured as cosy,[276] lightweight and could be put into rational production, it brought the whole family together, it was like baked, rose, and solidified in the same way as good bread, with the desired shape.[277] It was described as comfortable by the press picturing Poul Reichhardt (a famous actor) in his house in Hellerup recovering from a broken leg reading the newspaper sitting on the Egg.[278] The advertisements for the international press described the chair as suitable for families, kids could play there, could be move all around the living room, ultra modern,[279] modern,[280] elegant and sophisticated chair for the office, especially for guests who were going there to talk,[281] excellent design,[282] for sophisticated tastes.[283] During this period, the Egg was also used in the covers of the exhibitions of Danish Design; thus, it became the representative of the Danish Design, associated with the features of being warm, futuristic, Danish,[284] organic, social, funny[285], suitable for kids, intellectual, ultramodern, elegant, beautiful, and affordable also for the middle class.

[275]Politiken 11/2/64
[276]ekstrabladet, 28 December 1963
[277]cat_276: nye materialer, ny teknik, nye møbler; Dagens Kvinder, 10/9/ 59
[278]se og høre; 1961
[279]House and garden; october 1964
[280]cat_28:Oversættelse af en japansk annonce om danske møbler
[281]cat_21Meubles og decors, Januar, 1964
[282]Folkebladet føre Gladsaxe Komune, 15/10/1964
[283]cat_25: costance december 1963
[284]Aarhus Statidene 29/9/1964
[285]house and garden, october 1964

5.3.4 Episode 3: The decline of the Egg (1966-1979)

The figure presents the network of the third episode is presented. It is evident from this figure that that many actors left the network, others have joined, and some of them have become black boxes, while others are leaking black boxes, because the actors struggle to close totally.

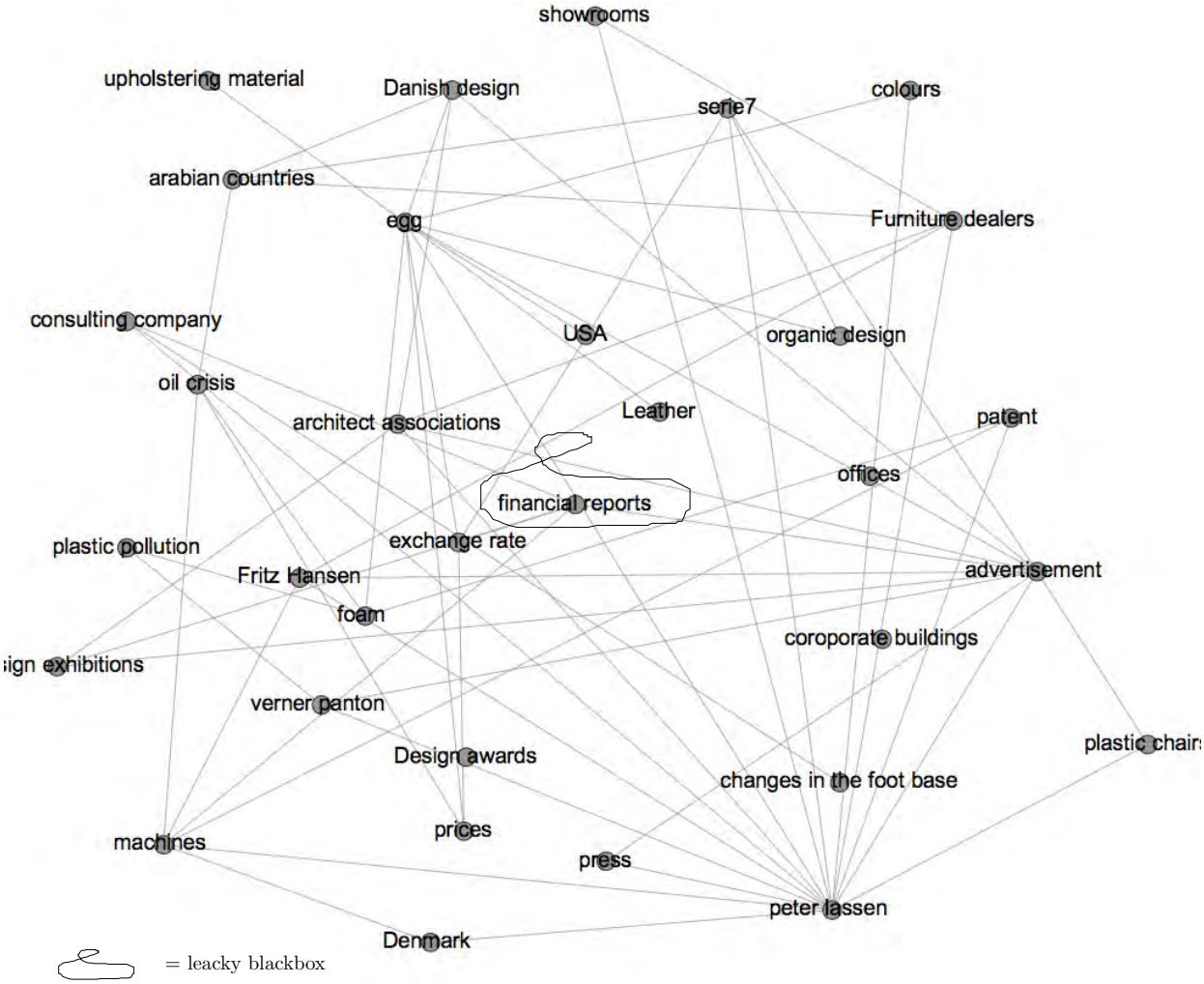

Figure 5.30. Allies in the network in the third episode. Network showing the allies enrolled and their relationship in the third episode, during which there has been a decrease in the sales, a period of 12 years.

Allies in the network The following table represents the allies in the network that caused the decline of the Egg, but still allowed to keep it alive.

Advertisement pictures	Arabian countries	Architects associations	Arne Jacobsen
Changes in the foot base	Consulting company	*Colours by Arne Jacobsen*	Denmark
Danish Design	Danish kr	Design awards	Design exhibition
Financial reports	Exchange rate	Fritz Hansen	Furniture dealers
Leather	Egg	foam	Oil crisis
Plastic chairs	Corporate buildings	Offices	**Organic design**
	Press articles	Peter Lassen	Verner Panton
Plastic pollution	Serie7	Showrooms	Upholstering materials (others)
USA	All the machines use for producing the chairs	Prices	**Styropor**

Table 5.10. Allies and black boxes in the network of the Egg chair, third episode. The allies in the network in blue are human allies, the red ones are non human allies and the black one is a black box, and the one in italics is a leaky black box.

Translations, mobilisations, enrolment

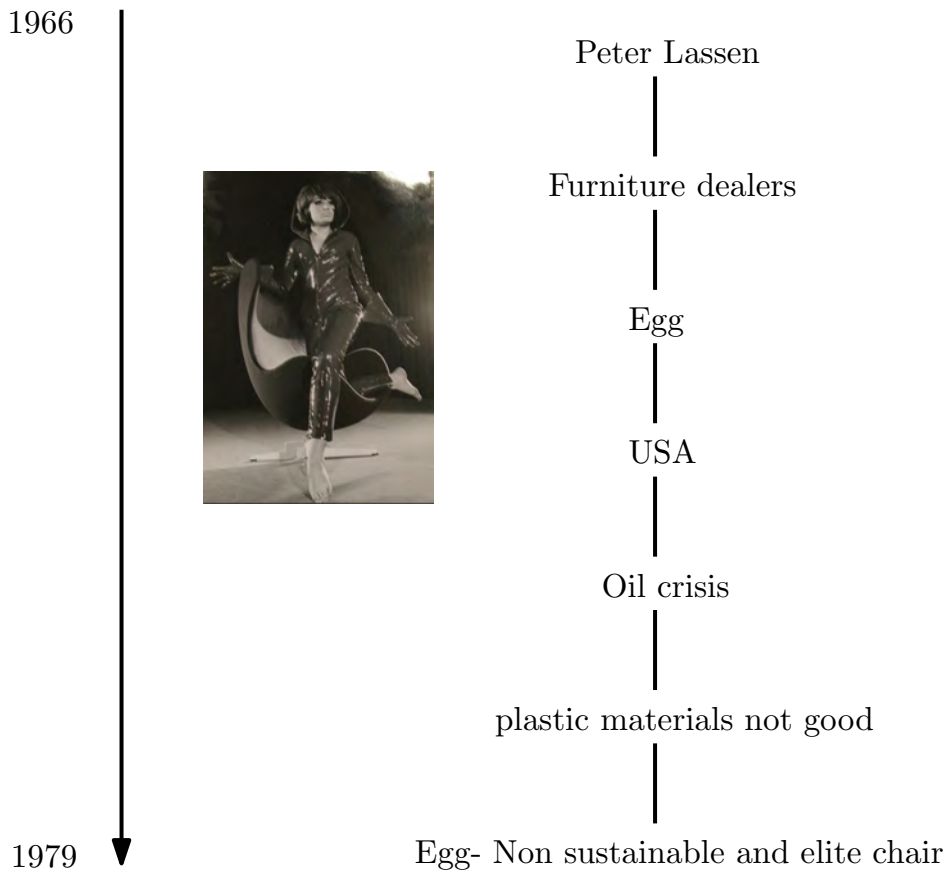

Figure 5.31. Translations. Overview of translations that Peter Lassen initiated but brought to make the Egg into an expensive, unsustainable and elite chair.

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During this episode, the sales of the Egg decreased drastically. At the beginning of the '70s, Peter Lassen, the new CEO of Fritz Hansen, invested in the design of Verner Panton, considered funkier than the design of Arne Jacobsen, who died in 1971. Peter Lassen engaged the production in the new chairs of Verner Panton, considered as Pop and alternative, suitable with the events of that years (the students' movements and the '68). He was a provocative and colourful new designer working for Fritz Hansen and competing for attention and resources. He used strong, happy colours, and inflatable furniture. He pioneered a single-moulded plastic Panton chair and refused to accept gravity by creating the Flying Chair. Verner Panton represented the future, while Arne Jacobsen was associated with the past, the old, and the decadent.[286] Due to high prices of the plastic material, Peter Lassen hired a consulting firm to make the production more rational.[287] The chairs of Verner Panton were pop, made of plastic, considered as a new and

[286]press review, Frederiksberg Bibliotek
[287]minutes from the meetings

interesting material, and the company invested in changing the production from wood to plastic.[288] In the'70s, during of the oil crisis, Fritz Hansen was almost about to fail economically.[289] Arne Jacobsen's Egg was considered expensive and old, not attractive to be built.[290] After the oil crisis, there was a world-wide economic recession. The plastic material was not seen anymore as something futuristic and novel, but as a bad material, pollutant and expensive due to the oil prices.[291] In 1974, Peter Lassen was advised to introduce a modification in the foot base of the Egg for reducing the costs by making the base of all the chairs similar to each other and using only a moulding machine.[292] His furniture enjoyed high growth in sales and popularity, nearly rendering the Egg a classic from the past. When asked what kept the Egg alive during this period of low sales, the design director highlighted the role played by architects who "bought them for their homes and chose them for new buildings". In 1979, only 83 Egg chairs were produced.[293] The production was maintained and not taken out, because in USA, the architects, being advised by the furniture dealers, were looking favourably to the Egg in a nostalgic way, and they were willing to use the Eggs as corporate chairs when doing consultancy for their clients, as something exclusive.[294] A consultancy company even advised to take out the Egg from the market, because it had no future, and people would spend money on accessories, watches, clothes, sunglasses, shoes, but not on furniture; they predicted that there was no future for the furniture, because only in Scandinavia, USA and Japan, people invited guests home for dinner. In the other countries, it was consuetude to go out.[295]

Spokesperson Peter Lassen was the spokesperson in this period, speaking in behalf of Fritz Hansen and of the chairs, making decisions on the production items.

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to displace the Egg as classical design chair.

[288] exhibition at the museum of applied art, Copenhagen and Victoria and Albert Museum
[289] fh_17_1: newspapers scanned from the museum in Allerød
[290] interview with the manager of the museum of applied art, Copenhagen
[291] see the episode 3 in the Serie7
[292] minutes from the meetings
[293] information found in the warehouse
[294] information found in the design School in Oxford
[295] minutes from the meetings

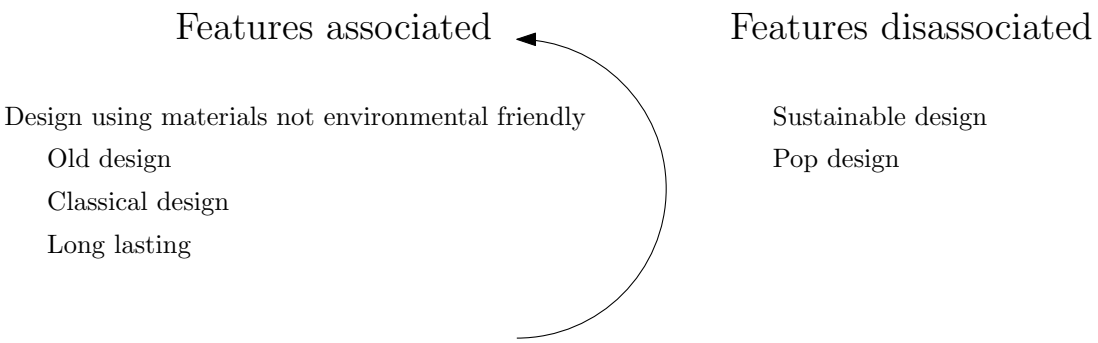

Figure 5.32. Design features as an outcome of choices. Representation of the process of inclusion and exclusion of the features that the spokesperson worked for and against to support the programme of action which resulted in the decrease in the sales of the Egg- the third episode.

The Egg was not the priority in the strategy of Fritz Hansen. Peter Lassen wanted to save the company that was almost bankrupt, and the sources of revenues were coming from the Serie7, not from the Egg. He was associating the features of classic and Danish design, exclusiveness and nostalgic by exhibiting it, so the American architects were willing to buy for exclusive studios in big corporate offices.[296]

[296]review of the newspaper found in the museum in Allerød

5.3.5 Episode 4: The Second life of the Egg (2002-2009)

The following figure represents the network of the fourth episode. It is possible to see that many actors have left the network, others have joined, and some of them have become black boxes, while others are leaky black boxes, because the actors struggled to close then totally.

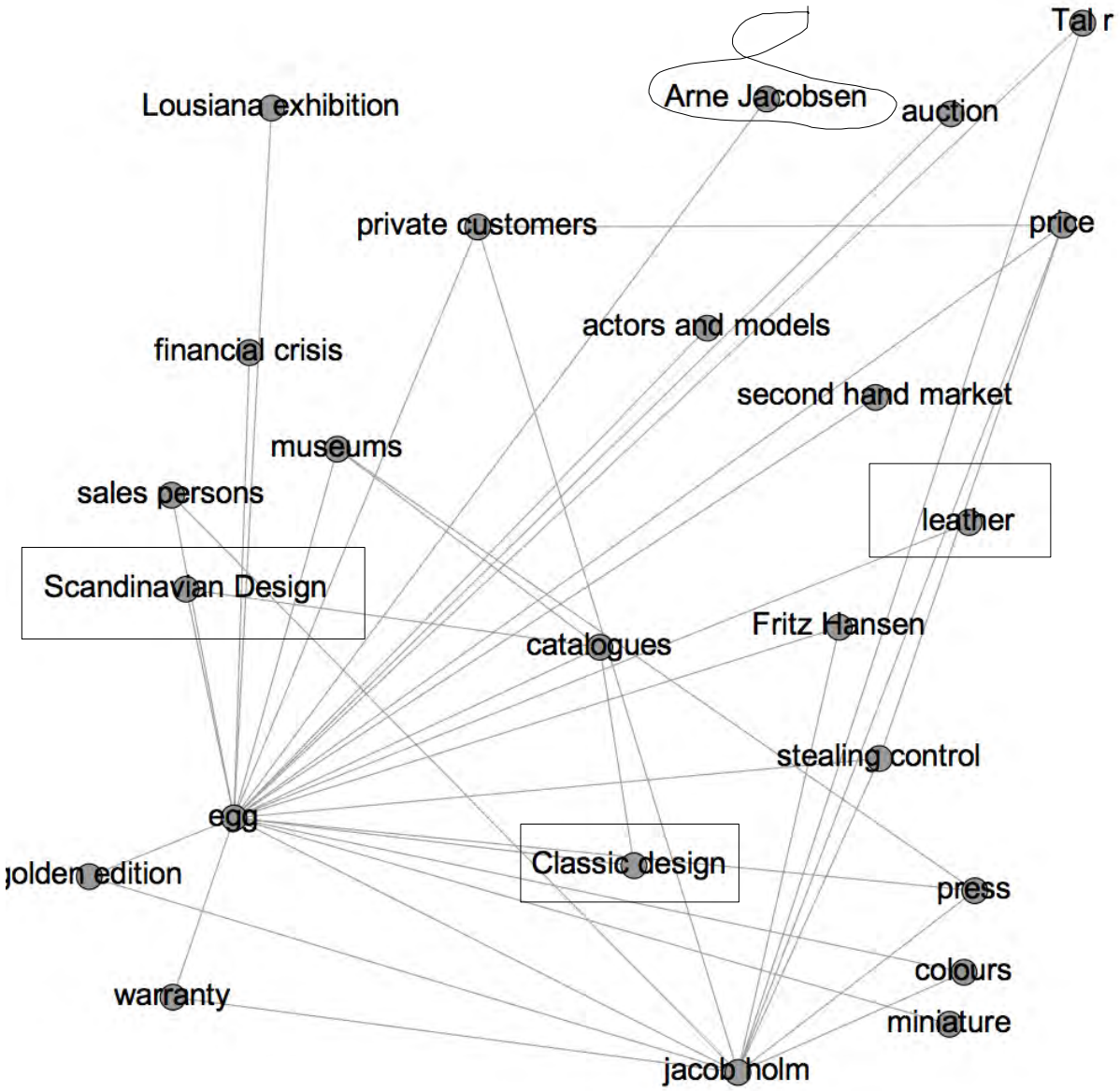

Figure 5.33. Allies in the network, fourth episode. Network showing the allies enrolled and their relationship for sustaining the sales of the Egg chair, covering a period of 7 years.

Allies in the network The following table represents the allies in the network that were in the last episode of the Egg.

Advertisement pictures	Actors and models	Architects associations	Artists
Arne Jacobsen (values/ qualities of)	Auction	Catalogues	**Classic design**
Colours (Arne Jacobsen)	Colours (others)	exhibitions (art exhibitions)	Factory in Lillerød
Financial reports	Financial crisis	Fritz Hansen	Furniture dealers
Golden edition	Jacob Holm	IP rights	**leather**
Louisiana exhibition	Mac Donald	Miniatures	Museums
TV shows	Pictures with important persons	Price	Private customers
Sales persons	**Scandinavian Design**	Second hand market	Stealing control
Tal R	Warranty		

Table 5.11. Allies and black boxes in the network of the Egg chair during the fourth episode. The allies in the network in blue are human allies, the red ones are non-human allies and the black one is a black box.

Translations, enrolment, displacement

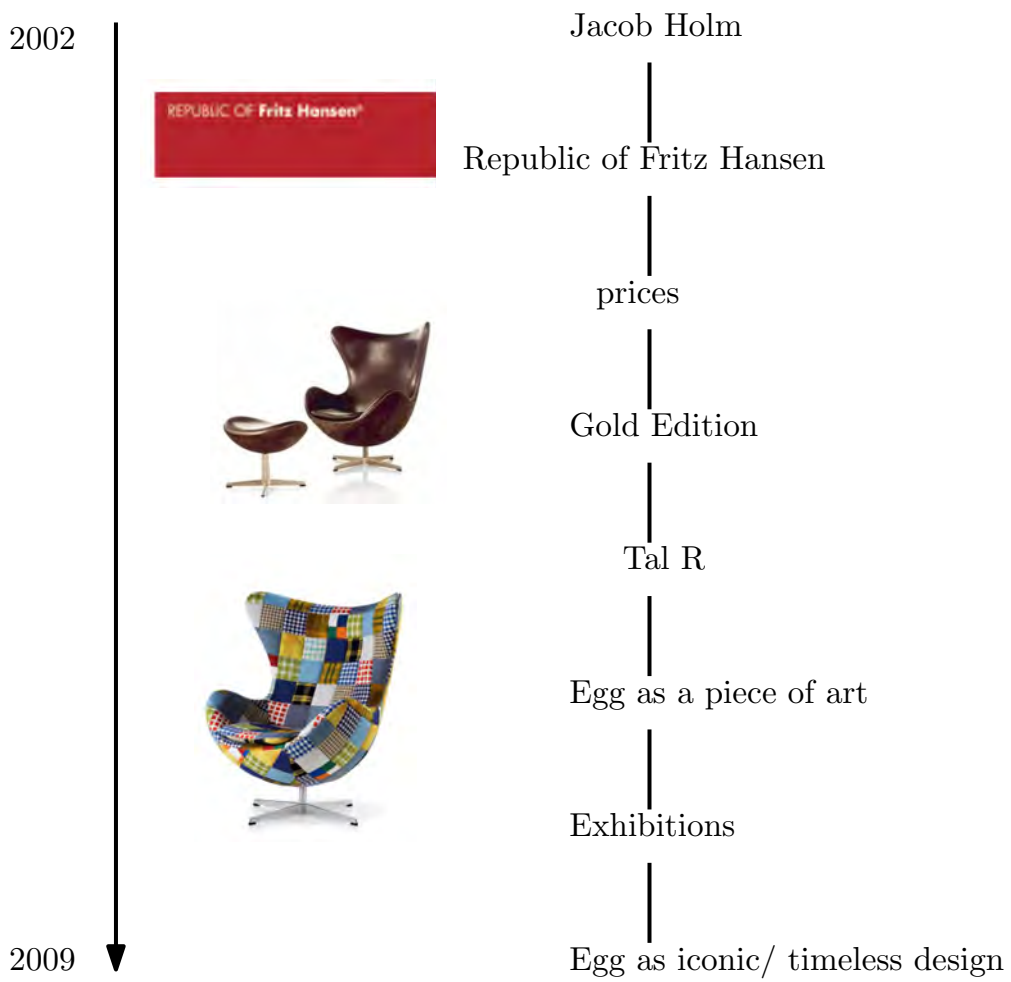

Figure 5.34. Translations in the fourth episode Overview of translations that Jacob Holm initiated and made the Egg a Scandinavian icon, fourth episode.

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The Egg was sold in the market at a high price, because the production methods and materials moved the Egg to be an expensive piece of furniture. Parallel to thoughts about taking the Egg out of production, events in the early 1990s led to a renewed interest in Arne Jacobsen and his furniture.[297] In 1991, the Danish Architecture Centre displayed an exhibition about his life and works, and in the same year, a red Egg appeared on the front cover of the Danish design magazine Bo Bedre for celebrating the magazine's 30th anniversary. In the '90s, the design newspaper started to publish again on the Egg, especially, after the exhibition in 1992. The Egg was showed in different TV programs, from MTV, it was appealing to the young audience, to more adult shows.[298] In one, Bill Clinton was interviewed sitting on the

[297]Interview with the former design manager
[298]informal talk with the shop manager at the auction house in Copenhagen

Egg (in the '90s and then again in 2006 in Denmark).[299] The furniture as well as the fashion magazines were mobilising the actor "retro design". They were creating stories and stimulating the storytelling process connected to an emerging image of retro furniture as super modern. Fritz Hansen management mobilised Arne Jacobsen and his values as an actor to revitalise the interest in it. Jacob Holm, in 1997 became the new CEO Fritz Hansen, and he implemented a strategy with the purpose of transforming the production company into a branded company, and to make the customers feel part of the brand. Therefore, he changed the name from Fritz Hansen to the Republic of Fritz Hansen. The actors involved with the concept are therefore part of a republic, part of a community, an elite.[300] It was also intended to communicate certain values to the designers and explicit which one were the shared one.[301] Young people were mobilised from the appearance of the Egg in a MTV program for interviewing singers, or a TV series broadcasted by MTV. The young customers did not have money to buy the new furniture, therefore, they went into the second hand market. This had two effects: (i) it mobilised the concept of retro and (ii) it interessed people to buy the Egg, because it was not a risky investment and there were people willing to buy it in case of changing conditions.[302] At an auction in Stockholm, in 2002, an Egg was sold for 30,000 dollars. The rumour around that beat was that Marilyn Monroe sat naked on it.

Based on this re-interessement process, a company based in Nærum started to build and sell miniatures of the Egg (later expanded to other Fritz Hansen furniture). In 2006, McDonald hired Philippe Avanzi (a leading French interior designer) to revitalise its brand and the concept of fast food restaurant for 6000 restaurants.[303] Fritz Hansen agreed to deliver McDonald red Eggs for the restaurants (2200 Eggs),[304] but Jacob Holm decided to suspend the supply when he discovered copies of the furniture in UK: McDonald bought many copies of the Egg in the British market for a lower price. In UK the design property is protected only for a limited number of years (25 years), therefore McDonald was not punishable for buying and displacing copies in UK, but it could not have done that abroad. Avanzi, not supporting the decision of McDonald affirmed:

[299] http://0eggchair.com, 23rd October 2013

[300] interview with the former designer

[301] interview with the former design manager

[302] Guide to the Scandinavian design

[303] Time, Thursday 11 October, 2007, available at http://content.time.com/time/business/article/0,8599,1670431,00.h
7th february, 2014

[304] documents provided by the assistant of the CEO

I don't feel betrayed, but poorly misunderstood by a few people in England who didn't understand the importance of staying authentic. This was something extremely clumsy, which the English are going to have to rectify.[305]

However, the problem of the copies at a lower price interessed the IPR strategy in some markets. Fritz Hansen became aggressive in terms of protecting the IP and introduced different actors to demonstrate the originality of the Egg. In the continental copyright law, the product is protected for 70 years after the death of the designer, and the Egg is also protected by a three-dimensional certification. So, it is illegal to produce copies in a country where the design is not protected, but it is illegal to sell those copies in a country where the design is protected; for example, it is legal for Danish consumers to purchase a copy of the Egg in England, as long as it is not sold or given away.[306] As mainly design connoisseurs could recognise the difference between an original and a copy, Fritz Hansen decided to introduce a device to frame the customers in recognising a copy from the original. The consumers that were interested in the Egg and its feature would not buy a copy, and the label made possible to the consumer less able to recognise a copy from an original to distinguish them. This label also allowed to fight the copies; the little red label signified that the piece was an original Fritz Hansen piece of furniture. In case of copies, it can be processed as trade violation in all the countries.[307] In 2002, Louisiana organised an exhibition on the life and work of Arne Jacobsen. The exhibition received many visitors; architects and journalists were mobilised. After that exhibition, the numbers of books about the life of Arne Jacobsen, his furniture, or the architectural work were increasing. In 2008, the Egg celebrated its 50th birthday. For the event, Jacob Holm asked Tal R, a Danish artist, to celebrate the commemoration, and to support the launch of Golden Edition, that is the Golden Egg with an exhibition.[308] The Golden Eggs were individually numbered Eggs in chocolate brown leather with soft, smooth suede on the back and with a hand-polished solid bronze base as a finishing touch and limited to 999 items.[309] They were sold together with a golden book explaining the history of the Egg. The Golden Egg was launched in February, and the items were

[305]Time, Thursday 11 October, 2007, available at http://content.time.com/time/business/article/0,8599,1670431,00.html, 7th february, 2014

[306]Christiansen et al, 2010

[307]informal talk with the person in charge of the management of the intellectual property

[308]interview with the brand manager

[309]commemoration book, Allerød museum

sold before the company had advertised in the newspapers.[310] It was sold-out at the retailers as well. The base of the chair was of bronze, and the colour fitted with the exclusivity of the chair.[311] Fritz Hansen received the following notes:

> *I am really enjoying the Egg, thank you. I was wondering if you have an anniversary footstool.*
>
> *Thank you so much. Now I have signed up for the book and am looking forward to reading it while sitting in my Egg, which I am so pleased with, they are the best USD 15,000 I have spend in a long time.*
>
> *Dear Sir/Madam I am very, very pleased to have acquired number 2 of your 50th Anniversary Egg chair in March this year, from Chaplins of London, who also gave me excellent service. I am also led to believe (please correct me if I am wrong) there will be a similar limited edition Swan Chair. For my own collection, I would be overjoyed if it were at all possible to acquire number 2 of this Classic piece of furniture/art. Can I please stress that I am not purchasing these chairs for profit, but to add to my collection of 20th century furniture design. It would be lovely to know what part of the world number 1 of the Golden Egg is. Museum? MoMA? Keep up the good work.*[312]

Tal R created 50 unique patchwork editions of the Egg. Originally, these Eggs were meant to be sold at an auction; however, the management has decided to keep them together and mobilised later in exhibitions to be brought around the world into museums and galleries, to qualify it as a piece of art.[313] This project, however, met resistance from Fritz Hansen employees. The persons, in charge of the covering of the Egg, thought it was silly to attach patchwork to the Egg. They considered Tal R was not sufficiently related to the Egg network, and he did not know the history behind the Egg. Tal R was interpreting the Egg as related to the womb in the Freudian idea. It was necessary to create a narrative for the personal to accept the patchwork, because they were not willing to sew it.

[310] GUF (internal newspaper)
[311] Christiansen et al, 2010
[312] messages exhibited in the warehouse of Fritz Hansen
[313] interview with the brand manager

> *It's about that patchwork. It's an old needlework tradition, it's about reuse, and in relation to style and exclusivity it is radically opposite. There's a clash between the expensive, exclusive, and minimalistic Egg and collected pieces of old clothes from second-hand markets.*[314]

During an interview, the brand manager reported:

> *We wanted to do something to celebrate the Egg's 50 anniversary, and the idea of collaborating with Tal R actually came from our CEO. How the relation started I am not sure. But for that specific project, it came out with the idea to contact Tal R and make an experiment, try to create a project where we can revitalise and create something funny and it hasn't to be necessary about money, it was to communicate a good story and he has given free lance to come out with the idea. Everything was done here, I know because I was heavily involved in the project, it took 18 months for completing it. So Tal R developed the idea, he explained it us, he explained the idea of patchwork, he travelled and located the different fabrics, and one a week we had a bag delivered here, we cut them, we produced in-house. That was a very long project, to created and to re-gain attention to celebrate the Egg. Also the collaboration with the mini, for example, was a perfect collaboration, because we shared many values and it is very open and fun company and that was an opportunity to add something young to us and they can have some quality and design to them that is Fritz Hansen's point of view the perfect collaboration. Both exhibitions are still travelling... and that has added much more value than originally, because originally they were meant to be auctioned. But then the financial crises ... they turn out to be much more valuable to us travelling around the world as an exhibition.*[315]

The exhibition was presented in Milano Corso Como for the Fuori Salone (one of the most important design exhibitions of the year) during which the new furniture pieces were introduced. In 2009, Paul Smith launched a miniature of the Egg with Paul Smith tissue. After that, he collaborated for upholstering the Egg, and in the British market, this created stronger ties to the Egg. The market changed and it became 50-50 instead of 70 retailing and 30 private, because the new CEO wanted to increase the prices and have higher margins and not give too many discounts.

[314] article from the republic of Fritz Hansen magazine, 2009

[315] interview with the brand manager

Spokesperson Jacob Holm, the new CEO of Fritz Hansen.

Features associated and disassociated The following figure represents the arguments for which the spokesperson was working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to buy the Egg as a classic design chair.

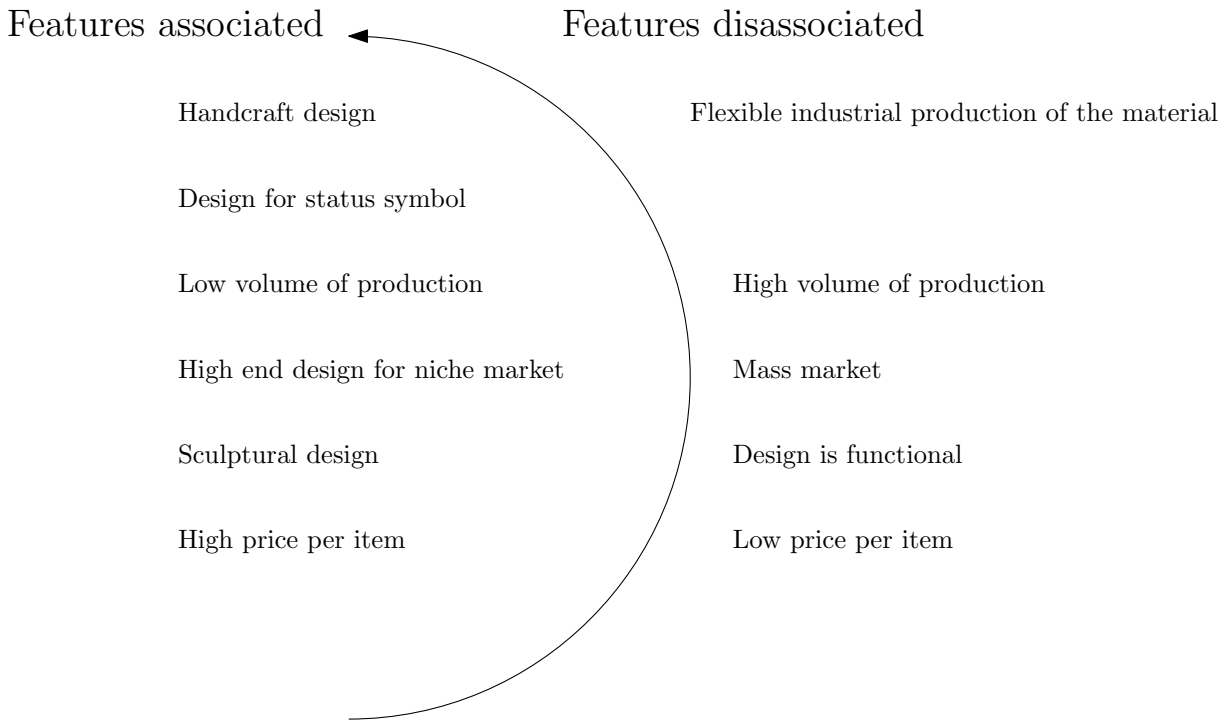

Figure 5.35. Design features as an outcome of choices, the fourth episode. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of increasing the sales of the Egg, the fourth episode.

The features associated to the Egg were related to the fact that the Egg was described as the result of craftsmanship, handmade (refinished by hand). The craftsmanship quality made each Egg unique; none of the Eggs are identical to the others, and they become more beautiful with the sketches on the leather, showing the feature that was not industrialised and the material was not serial material.

5.3.6 Episode 5: The decline in the sales (2002-2013)

The following figure depicts the network of the fifth episode. It is possible to see that many actors have left the network, others have joined, while some of them have become black boxes, and others are leaky black boxes, because the actors struggled to close totally.

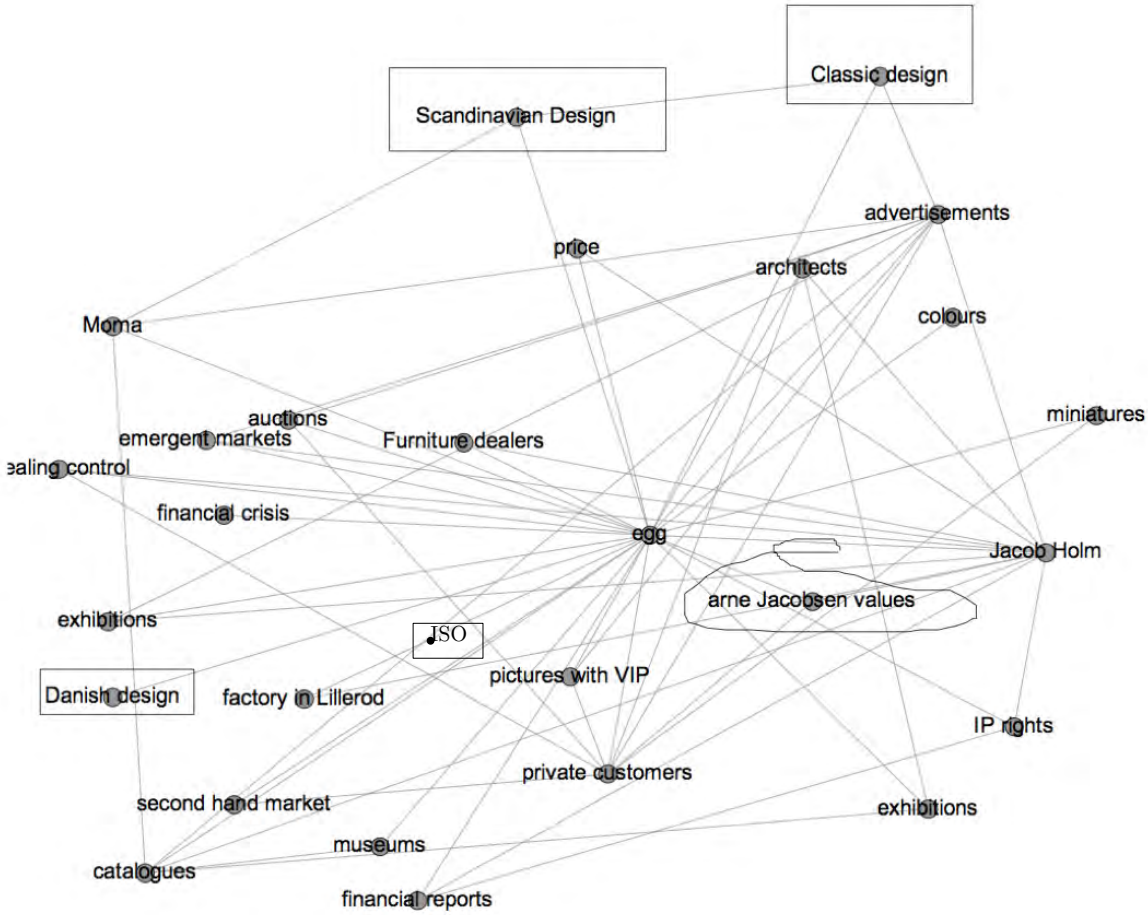

Figure 5.36. Allies in the network, in the fifth episode. Network showing the allies enrolled and their relationship for sustaining the sales of the Egg, covering a period of 10 years.

Allies in the network The following table represents the allies in the network that were in the last episode of the Egg.

Advertisement pictures	Actors/ Pictures with important persons	Architects	CSR
Actors and models loving the Egg	Auction	Emergent markets	*Arne Jacobsen (values/ qualities of)*
Catalogues	**Classic design**	Colours (others)	Control system
Jacob Holm	**ISO 9001 and ISO 140001**	IP rights	Exhibitions (art exhibitions)
Factory in Allerød	Factory in Lilleroød	Financial reports	Financial crisis
Fritz Hansen	Furniture dealers	Furniture dealers	Miniatures
Moma	Museums	Pictures with VIP	Price
Private customers	Republic (magazine)	Second hand market	Sales persons
Scandinavian Design	Stealing control	Warranty	Wool

Table 5.12. Allies and black boxes in the network of the Egg chair during the firth episode. The allies in the network in blue are human allies, the red ones are non human allies and the black one is a black box.

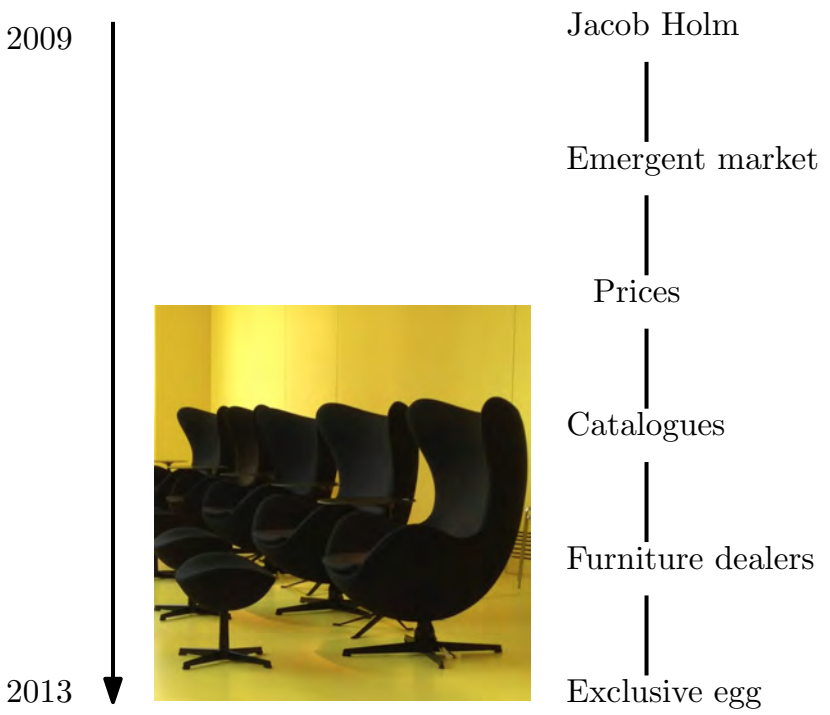

Figure 5.37. Translations. Overview of translations initiated by Jacob Holm that made the Egg as Scandinavian icon, exclusive chair in the fifth episode.

Translations, enrolment, displacement Translations, enrolment and displacement when the management focused on selling lower volumes with higher profit and establishing the company as exclusive brand, the former design manager declared:

I think it has been a very good strategy for the company, and it has certainly helped to establish it, since they were not internationally established when I started in Fritz Hansen. In the late '90s, the Egg and the Swam were not established internationally as design stars or icons, they were become in the mean time, and sales have also risen dramatically. So I think today Fritz Hansen is making more profits on the egg and on the swam than not on the Serie7[316]

As an advertisement strategy, they were co-branding with other products, not letting the Egg stage alone. There were often product placements:

We don't seek it, we are very privileged in the way that we don't have to, but we have been asked so often. In our own market we say no quite a lot... in Denmark and Scandinavia it was a matter of simply being careful, because we could have all over if we wanted, but we try to select and try to have worldwide... we have decided on a company... it's part of our strategy that we don't push our products in terms of product placement and we don't want to pay for it because we don't believe there is good value out .[317]

Fritz Hansen has also started to mobilise the CSR as an actor to interess more customers. For this reason, Fritz Hansen complied with the legal requirements as well as the requirements defined in ISO 9001 and ISO 14001. This policy was implemented through Fritz Hansen's quality and environmental management system. Fritz Hansen's ambition was to design and manufacture products of the highest quality whilst taking environmental challenges into consideration during the development process, reducing toxic emission and exposure to toxic chemicals during the production process as well as in the final product.[318]

Like foam that is made from oil like every other foam, and of course we would like to find some organic material that should be based on new resources instead of oil, but still.. so.. we do that all the time to improve the existing collection and when we do new products we consider carefully we just have to make sure that the product is not falling apart or becoming not very nice to look at after one or 2 years. It should be last, so the quality perspective is also very important.[319]

[316]interview with the former design manager
[317]interview with the brand manager
[318]financial statement
[319]interview with the design manager

During an interview,[320] Jacob Holm declared that the majority of persons in Denmark and Europe knew Fritz Hansen, but there were also the emergent markets that were willing to buy the items. There were new markets that had more interested, and there were many architects that know about Fritz Hansen, so they were willing to use the chair in their building. The architects were the mediators for making the end users interested in the Egg and the other Fritz Hansen items, especially in the new markets (China, South Korea). However, as the customers in these markets yet to being framed properly, they could not recognise a copy from an original.[321] Therefore, Fritz Hansen needed to invest for framing them. The competitors of Fritz Hansen (Italians, French and Germans) had already invested in interessing and framing the customers; thus, he recognised the lack of a mediator for Fritz Hansen, that could transport and transform information for the Chinese market and adapt to the local needs.[322]
During a meeting, the board members declared that Fritz Hansen had been taking into consideration to mobilise new media, such as blogs and websites. There was richer information in blogs, particularly in independent blogs of design-lovers. However, the website of Fritz Hansen and its pages in the social media were not mobilising users in interacting with it very much. Moreover, there were charity events in sales of the Egg chairs with signatures of famous people, including politicians and actors for humanitarian associations like the Red Cross, and this had mobilised the interests of different actors, but from the websites it was not reflected that Fritz Hansen was involved directly with them.[323] Paul Smith had been enrolled in the network for upholstering the Egg in the UK market. In the last Triennale- Fuori Salone, the Egg (original) was present in the Danish Section. However, its shape was present in many other stands: many chairs were having very similar shapes, with added features (for example: massage), while others looked very clumsy.
MoMA has bought a copy of the Egg to be exhibited, together with other Danish Designs, in the permanent collection.[324]The Egg has been used in some Hollywood movies, mobilising the interest of the customers while watching movies. The Egg shell is produced abroad, but it is assembled in Denmark and applied the external layer in Denmark.

Spokesperson Jacob Holm, the new CEO of Fritz Hansen.

[320]interview at: mød toplederen
[321]conversation with the marketing manager
[322]interview at: mød toplederen
[323]0eggchair.com
[324]Politiken

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to buy the Egg as a classic Scandinavian design chair.

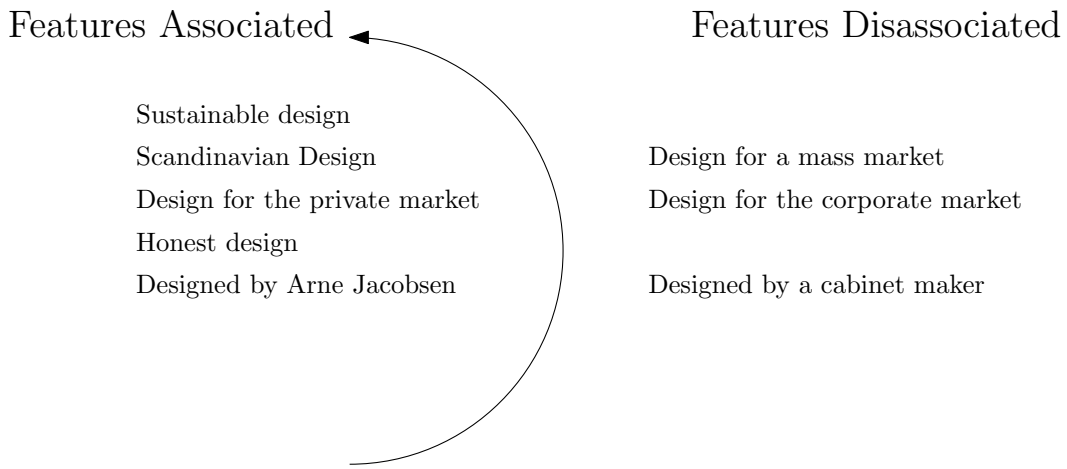

Figure 5.38. Design features as an outcome of choices, firth episode. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of increasing the sales of the Egg, in the fifth episode.

The associated features were are hand-crafted, low volumes of production, indicating that the Egg was long lasting, harmonious, sustainable, serene, honest, beautiful, elegant, representing Arne Jacobsen values, and it aged well because of the material was made of:

> *The first one superior quality it is because we, as I said before, we try to go to for the best material for the product, the best raw material, the best surface yes, the best quality possible because if we are making long lasting products visually, we have to make products that are long lasting visually, and they have also to last from a material point of view. The leather is important and it ages well, it becomes even more beautiful with age. A piece of leather like this for example it is painted as most of the leathers are because then you can cover small imperfections, scars, it has always been what we call nature, beauty marks in leather like we have scars, small marks, so have the cows, so u print on, you paint on to cover. But a really good piece of leather is completely open it is not painted, but not treated in anyway, you can make decrease of thinker and mark but it will became more beautiful over the years because there is no colour on it, it won't get it... how do you call, warn out. With this one you can see maybe in 40 years you can see the paining going off and it would look very*

nice, but a good piece of leather it is more expensive but it last much longer.[325]

The feature of exclusivity have been reinforced by the celebrities all around the world, being photographed on the Egg chairs or declaring their admiration for this chair; for example, Brad Pitt declared the Egg as his favourite piece of furniture. During Salone del Mobile in Milano (April 2012), Jacob Holm decided to bring the sewers to Milano, positioned them outside the shop to demonstrate that the Eggs were really hand-made, artigeneal craft, that none of the Eggs could be similar to each others because of their craftsmanship. However, even if so refined and unique, not industrially made, they were not luxury items; therefore, they were disassociated with the quality of being a luxury good. The Eggs were exclusive but not luxury. The luxury feature would mobilise a different market, and contrast in the features associated to democratic Danish Market, where everyone has the right to have access to it, love for beautiful things, and not paraded around the social states.

[325] interview with the design manager

5.3.7 Conclusions- Egg

The Egg was analysed in five different episodes. First episode involved the product development including the development of the Styropor, the creation of the Egg, and Swan translating the Eames and Saarinen Chairs; the second episode involved the introduction in the market, during which the sales were high, the chair was considered ultramodern, suitable for industrial production and was used also as furniture in the movies in Hollywood. The decline came in the third episode during which the new CEO preferred to produce the chairs of Verner Panton, and the Egg was considered only for few elites. In the fourth episode, the sales increased, and the actors were attached to the chair. Like third episode, in the final episode i.e. in the fifth episode the sales had declined again.
The Egg and the numbers of items sold were the result of the process of translations, enrolment, mobilisation, and associating features.

In the following table, the episodes are summarised.

Table 5.13. Episodes of theEgg summary of the empirical study of the Egg.

	Allies in the network	**Translations, enrolment, mobilisation**	**Spokesperson**	**Features associated and dis-associated**
Episode 1:The design of the Egg (1945-1958)	The actors involved in the development of the Egg were heterogeneous and numerous; due to the complexity of the network, this episode was divided in two sub-episodes: the development of the Styropor (the material of the shell of the Egg) and the design of the Egg	The Styropor, a new material invented before the War, was translated from war material and then translated as material for the furniture industry. Hansen and Jacobsen translated the Eames and Saarinen chairs, and the Landmandsbaken chairs into the Egg and Swan for the SAS hotel	Eames and Saarinen were the spokespersons in USA, Søren Hansen and Fritz Hansen as spokespersons in DK; Arne Jacobsen was a macro-actor, representing the network of actors involved in the design	The spokespersons worked for associating features that framed the chair as industrial production, suitable for mass production, and as high end design suitable for the mass market, while they were working against the features that could frame the Egg as hand-crafted, as an ornament, high price
Episode 2: The introduction of the Egg in the market (1959-1965)	In the network there were actors that were working against the chair (the press and some architects criticising the chair), but the programme of action and the relations among the actors were strong, minimising the struggles, leading to high sales.	Søren Hansen initiated the translations to make the Egg an ultramodern lounge chair.	Søren Hansen; Arne Jacobsen was a macro-actor	Søren Hansen worked for framing the the chair as quality chair, original, Danish design, mass production, exportable in different markets
Episode 3: The decline of the Egg (1966-1979)	Many actors left the network, other have joined, but they created struggles for the chair, undermining the sales, like the oil crisis, the increases of price in the plastic materials, the success of Verner Panton; it was kept in the production because in USA the architects were using it to furnish the CEOs' offices	Peter Lassen initiated the translation process, but it resulted in making the Egg an expensive, unsustainable and elite chair.	Peter Lassen	Because of the oil prices and the need of sustaining the Serie7 for avoiding the bankrupt, Peter Lassen did not work to frame the Egg, and the result was that the features associated were negative: unsustainable, expensive, old

Continued on next page

	Allies in the network	Translations, enrolment, mobilisation	spokesperson	Features associated and dis-associated
Episode 4: the Second life of the Egg (2002-2009)	The network was composed by new heterogeneous actors that worked for supporting the sales of the Egg, even if some actors entered and created some struggles (i.e. the financial crisis, and the presence of copies)	Jacob Holm worked for translating the chair into a Scandinavian Icon, promoting a limited edition, involving an artist to celebrate it, increasing the prices and making it circulate in many exhibitions	Jacob Holm	The spokesperson worked for associating features that could frame the chair as iconic, for a niche market, sculptural and refined by hand, not made for a mass market or industrially.
Episode 5: the decline in the sales (2002-2013)	The actors in the network are similar to the one in the previous network (episode 4); however, the spokesperson seems unable to interess them in the network any longer	The translations are shorter and involve the emergent markets, and resulted in the Egg being considered exclusive	Jacob Holm	The Egg is associated with the features of being sustainable design (upholstered of leather), Scandinavian design, for the private market and not for the contractor market, honest design, designed by Arne Jacobsen.

The theoretical implications of the analysis will be discussed in the conclusion of this chapter, with a cross-case summary, and expanded in Chapter 6.

5.4 Ice Chair

Figure 5.39. PLC of the Ice chair and the episodes analysed.

The Ice is a plastic chair manufactured by Fritz Hansen Eft. It was introduced in the market in 2002.[326] The Ice is made of a light synthetic material and comes in a wide variety of colours. It can be used both indoors and outdoors. For indoor use, it is possible to upholster the seat with a limited range

[326]see appendix for the pictures and documents

of fabrics or leathers. ICE is also available with matching armrests. The base comes in two different versions: standard height (stackable) and a bar stool. The chair has a grey frame made of satin matt aluminium with a coating. The legs and back brackets are made of natural anodised aluminium. The series also include a line of accessories.[327]

5.4.1 Episode 1: The design of the Ice (1997-2002)

The analysis of the first episode is focused on the product development phase until the presentation of the Ice in 2002.

[327]description from the website of Fritz Hansen www.fritzhansen.com/en/ice-ks200-chair-stackable; 9th, February, 2014

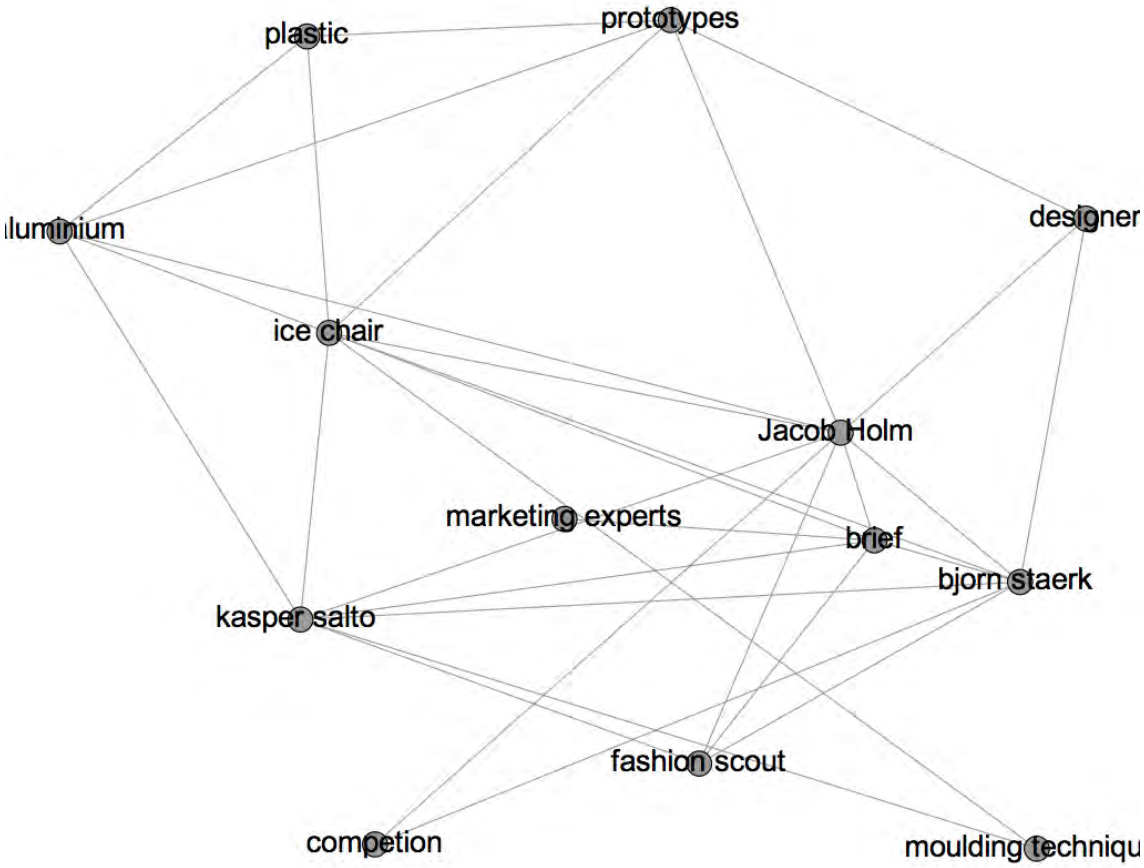

Figure 5.40. Allies in the network, in the first episode. Network showing the allies enrolled and their relationship in the first episode, during which there has been developed.

Allies in the network The following table represents the allies in the network that supported the development of the Ice.

Brief	Bjørn Stærk	Cafe chair	Competition
Designers in the competition	Jacob Holm	Kasper Salto	Laboratory
Marketing experts	Moulds for the plastic and aluminium	Plastic	Prototype

Table 5.13. Allies and black boxes in the network of the Ice, first episode. The allies in the network in blue are human allies, the red ones are non human allies and the one in italics is a leaky black box.

Translations, mobilisation, enrolment The following figure represents the translations that lead to the development of the Ice chair.

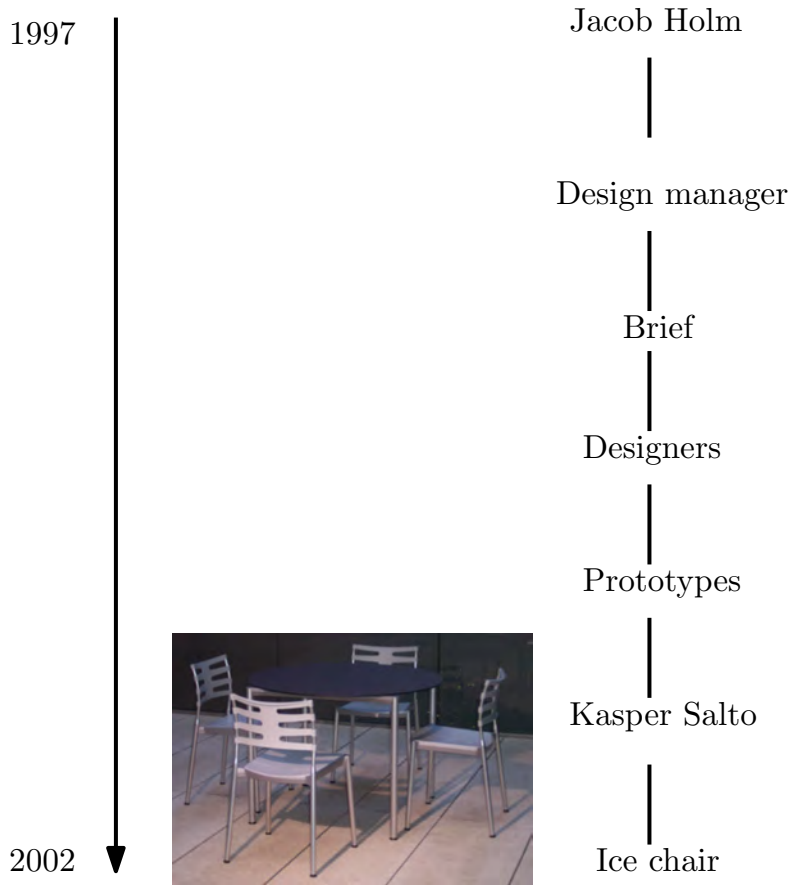

Figure 5.41. Translations, in the first episode. Overview of translations that the Ice chair went through from being an idea to be developed, initiated by Jacob Holm .

The Ice chair marked a milestone in the history of Fritz Hansen. Ice chair, equally suited for both indoor and outdoor use, is the first chair with this double function made in plastic marketed from Fritz Hansen. Kasper Salto worked on the development of the Ice Chair from August 1997 to October 2002.[328] The designer commented this long process by affirming that

> *Fritz Hansen knows that good things take a lot of time, so they are calculating with putting time in the project... that's nice... this is very nice company to work for... that's the best...* [329]

He also admitted that it was a long process in terms of time spent for designing a chair:

[328]interview with Kasper Salto
[329]interview with Kasper Salto

> *The Ice chair took from August 1997 until October 2002, that's almost 5 years, but you can say not all these 5 years I was working hours from 8 to 5, there were a lot of meetings at the beginning the first year. You can say I wasn't very efficient the first year, and neither the second year. But you can say that in working hours it took 3 years together with Fritz Hansen. I had to work 3 years out of 5 and compared to that chair I did recently, it only took 2 years (...) Of course Fritz Hansen knows there can't be too long time in the development process because it costs a lot of money.*[330]

In order to better define the design brief, in the beginning, most of the time was occupied with meetings involving the design management team in Fritz Hansen (mainly the design manager and the CEO). First, Kasper Salto met the design manager, Bjørn Stærk.

> *Since 1997, actually. The first time I met Mr. Stærke, he was the head of designers for a lot of years...I don't know, maybe 10 years...I forgot. But we can say he was my contact person, and my friend now. He contacted me after seeing the chair I did for another company, I made the rolling chair, and that was my breakthrough in little Denmark. When he saw the chair at the museum of industrial design, he though: this is not a chair for Fritz Hansen, but can be interesting chair, way and functional way, practical and functional. That was really my big breakthrough to be contacted by Fritz Hansen, I have been dreaming for many years without daring of contact them because I didn't know what to say... so I just thought what I could do is to show the best I could do and than wait for something to happen. He came and we started the discussion about what he called the future chair of Fritz Hansen. It was a big thing....*[331]

In Fritz Hansen, the brief for that project was a document developed to specify which were the business needs for the design and for the designers, focusing on the product description and development, not on the aesthetic. The Fritz Hansen team was seeking for a stackable and durable chair that could be used both indoor and outdoor. During an interview, the design manager explained that the brief was voluntarily of few lines, in order to use it as a mediator during the meetings. In his experience, navigated designers

[330] interview with Kasper
[331] interview with Kasper

preferred only few lines to discuss with the company about their ideas, while inexperienced designers wanted to have a clear detailed description of what they were intended to do. The design brief was written by the design manger from Fritz Hansen along with the people working in the marketing department and fashion scouts. The company Fritz Hansen, in that period relied, heavily on the marketing department, which was investigating customers' needs and they employed fashion scouts to discover the latest trends around the world. The brief was a compromise between the needs of the market and the creativity of the design department:

> *A part of the brief was based on feedback, wishes, maybe on interviews with some of the customers, what is from the marketing and sales department, maybe with some interviews with the dealers and the partners, but also always part of the brief is original and defined by the design department, also from the managing director, the president of the company. It has never been based on market bench, so you should have only a reaction to market needs and that won't bring you an interesting product. Nobody have asked Fritz Hansen to come up with a chair that could be used outdoor and indoor, we first made the brief. This because we could see ourselves not something that we heard from the customers or for the dealers, this was because there was this new trend of spending much more time outside, not only in Italy and France, where there has always been the café culture, but also in Denmark and in Scandinavia, where people started to spend more and more time outside, since the late '90s, so I though it could be a challenging idea for Fritz Hansen to make a special new chair and include that in the brief. That is why we decided to do the Ice chair. The Ice chair became innovative compared to the other stocking chair in Fritz Hansen, because you could also use outside; of course several chairs in Italy have already this in their specification and in their concept. So it is always very important when you produce and want to develop new design furniture, that you bring in to bring new challenges in the briefs.*[332]

The design team listened carefully to the different actors before writing the brief. The brief was then discussed, modified, and approved by the management team. In this case, it was the outcome of negotiations and successful relationships between multiple actors, including designers, design manager,

[332] interview with the former design manager

CEO, computers, tables, contracts, fashion scouts and marketing department. It became a tool for the management of design processes and products. For the different actors, the brief had different goals; it was mobilised for different purposes. For example, for the design manager, it was an explanation of the needs for creating new product. For the CEO, it was a management technology tool, with the ability to abbreviate the distance between the designers and the management. For the designer, the design brief was considered a departure point with an explanation of his future job.

> *Developing the idea, yes actually the Ice chair was a clear brief from Fritz Hansen. The idea was to make a multiple use chair that could go in and out of houses and also at the same time be light lightweight, strong and comfortable chair . . . and then I remember briefly I have started to discuss the brief very quickly. There was an outdoor chair in Fritz Hansen, the café chair, but it is not on the market anymore; it was very simple, but it was only for outdoor: it was very heavy so it could not blow with the wind, it was galvanised so it could never rust. It was very heavy durable and stackable chair but not very sophisticated anyway. It was not a very good comfort, it wasn't a chair that could go through history I would say, material wise and production wise was not technological advanced, it was not high techno. What Fritz Hansen wanted was to do a highly modern, ultra modern how he called, lightweight, strong, comfortable and stackable chair, that could do both: being inside for cafés, canteens, meeting chairs, but and also at the high level the CEO could have that chair in polish version. Ok he [Jacob Holm] didn't say that but like "sophisticated meeting chair, not office chair" for the boss. So, it could go in let's say all area. That was the vision: making a product that could go everywhere, in all the area, and to put in all the houses, in the buildings, in all the rooms in the buildings. It was a very ambitious project, and very hard to solve, because we all know that when you make the Swiss knife, it can do a lot of things and none of them is very useful, you know so; it was like"oh my god, I don't want to be like the Swiss knife in that sense". The Swiss knife is still impressive, it is nice made, it is very famous brand, but still, it is not a very good tool for opening wine, it hurts your hand, it is not a very good tool for cutting wood. You would prefer a real woodcut knife and so one that can do the job, that is not the best tool in the world. And we didn't wanted to do*

that, we wanted to take off all the criteria and make a good tool, for all the things. For the indoor- outdoor we actually succeed on it, and it was to balance the chair in that sense. If you wanted to be standing outside, it should be durable, resisting, tough enough for the rough environment we have, but also when you are taking indoor it should be soft and smooth and warm... not warm; but let's say, it shouldn't be too heavy, not too cold, they would never allow me to create a chair in pure aluminium because it is too cold to sit, to the balance between indoor and outdoor was the balance in this chair.[333]

The design process was described as a back and forth process where different actors intervened and contributed to the design:

We started by discussing the brief in December '99. I think it was at the beginning of December. Of course I though about the project all the time, but I had very hard time to go into it, because taking the wrong step at a earlier stage was crucial, like having the feeling of doing the wrong thing: I couldn't get a grasp on the project, I was sketching: it was surely the project I had more sketch all the time. I had sketch in my hands to find out what to do: what is this chair? Is it pure plastic chair made out of some plastic material that would last for long time, or is it pure aluminium; and that was the fantastic apart of this chair. I had the feeling that almost all the technologies in the world in my hands, normally I couldn't do that as unknown designer. Before I was restricted to the use of wood steal, all the so called primitive technology that would not involve any big mould like aluminium, plastic. Techno mould are very expensive tool, so it was only wood chairs that I did before. Now the world was opening up and I could do whatever I wanted to, of course collaboration with Bjørn e Fritz Hansen, so we had a lot of discussion where to go, how to do, how this product should look like, how should be... cheap. It started like a cheap product, it was 100.000 -117000 DKK I think. It was inexpensive, I would also say cheap Fritz Hansen product. That they should do, not to say that. They didn't dare to that area, because they already tried together with the world famous solo chair. That was in my opinion a fantastic chair, but it was misunderstood by many people in my opinion. At least by the sales

[333]interview with Kasper

didn't understood and didn't believe in that and didn't noticed in a way, they didn't feel it wasn't a real chair. I made a prototype in December '99, and that prototype I still have in the basement, and that prototype really convinced Bjørn Stærk and then a lot of people. I have to remember also to say that it was a competition between me and 4 other Danish teams. I still remember where I was standing when I got the call from Bjørn: I was standing at the design centre and he told me I won the competition. Until November '99, I didn't know it was a competition. Finally I heard 14 days or 3 weeks before delivering the prototype that there were other 4 people making the chair. It was good in a way because I was like: "ok, ok, ok (deep breath)... ok... " I knew I had to do something special, I used all my skills from the cabinetmaker, and I pressed all the time, I used all the time in these 14 days. I am my worst work's enemy because I always think: this can be much better, this could be a little better, and I should have done that. At the end, I was very happy, but he was not convinced when he saw it. He was quiet, and I asked: "what's is happening here? What do you say?" And he said: "I don't know what to say to you". I didn't get an answer right way, but then I found it was positive and I won the competition. Then we started, the work started with constructing; not designing but constructing, like to see it's quite close to the original chair. But there were many details that needed to be changed all the time to construct how the chair should standing outside. It would rain, the water will come inside the construction and hen we had to find out how to come out of the construction again, because we didn't want the water to stand inside the tooth, the belay, all these very very technical stuff we have to find out, and it was new for Fritz Hansen to design a chair that was moulded in any way. The frame moulded, the arms are moulded in high pressure, the seat and the back are moulded, the injections moulded, and the back was so hard to make moulded 2- 3 times, everything was on the edge of what we could do here in Denmark and in Italy it's in the culture, it's much more in the culture to make this kind of chair, it was not a chair new in the world not at all, but in the Nordic terms it was the first in this kind. Normally it is in wood, in steal in things not involving a lot of costs and tooling. We did a lot of testing so we could mould very cheap, I think Fritz Hansen made 10 sample of the chair we could mould and I was very excited because if the

construction was not good enough the all project, I was afraid that the all project could fall apart and I didn't want to, and winning didn't matter. Everything can go out of the hand and I was focus on my head that all Fritz Hansen needed I made for them, if I couldn't do it, someone else could do it. This was the only project I had and this was not very usual, I mean, normally you have more projects. I mean one or 2 projects as designer coming out, not in production but coming out from your studio each year and made one. I made no projects in 2 years except the Ice. I was very focused and I had the chair, I love the chair, it is my favourite item. It is like reading a book, you have done a lot of time, and it comes more more easy. For me it is always with function and base, and still there are many different, but still there are many different angles. Actually, one of the things that happened: Jacob Holm once mentioned that for commercial reasons he thought that the chair was a little too small, he looked at the chair and he said it is a very nice chair, but maybe a little bit bigger and I remember that and I though he must be right. Because I though smaller could be good, because there aren't too many spaces occupied, and we are more people in the earth, we have smaller and smaller apartments, so why should a chair big big if he can have one person sitting? That was ok. But he though in the commercial aspect, you should have a chair, not less that a chair. He was right, I think, so it was scaled 4- 5 % compared to my first prototype.[334]

Because of the higher costs involved in long development process, the design manager and the CEO in Fritz Hansen were not in the favour of such development process; however, the managerial team let Kasper Salto free to work at his own speed, at least in the beginning. In the brief, it was explained that the Ice Chair was meant to be a core product for the firm, a breakthrough innovation for the Danish market, revolutionising the concept of a chair used for both indoor and outdoor. The design manager contacted Salto after seening a chair he exhibited in the Kunst Industrieet Museet (museum of industrial art) in Copenhagen. Even if the design style of that chair was not aligned with Fritz Hansen design, he decided to involve Salto anyway. The CEO and the design manager contacted five designers, and they started a competition based on the brief they proposed. The designers were unaware that there was a competition. The brief produced by the top management

[334]interview with Kasper

described the characteristics of the chair: a multiple use chair that could go in and out of a house and also at the same time, it is lightweight, strong, and comfortable. At the individual meeting with the designers, the CEO and the managers discussed the brief. The brief for the new chair was inspired by a café chair that went out of production some years before in Fritz Hansen. It was a simple outdoor chair, but very heavy to move so it could not blow with the wind. It was galvanised not to get rust. It was very heavy, durable and stackable chair but not very sophisticated or comfortable. Material and production wise, it was a technologically advanced product. Fritz Hansen management was asking for a highly ultra modern chair, lightweight, strong, comfortable and stackable, that could be used both inside in café, canteen, and also indoor, as meeting chair used at the high managerial levels. It should be elegant and sophisticated enough to be used as meeting chair, not as office chair for the managers.

> *It's always a compromise. A part of the brief is based on feedback, wishes, maybe on interview with some of the customers, what is from the marketing and sales department, maybe with some interviews with the dealers and the partners, but also always part of the brief is original and defined by the design department, also from the managing director, the president of the company. It has never been based on benchmarking, so you should have only a reaction to market needs and that won' t bring you an interesting product. Notably have asked Fritz Hansen to come up with a chair that could be used outdoor and indoor, we first made the brief. This because we could see ourselves not something that we heard from the customers or for the dealers, this was because there was this new trend of spending much more time outside, not only in Italy and France, where there has always been the café culture, but also in Denmark, where people were spending more and more time outside, that was starting in late '90s, so I though it could be a challenging idea for Fritz Hansen to make a special new chair and include that in the brief. That is why the Ice chairs. Therefore the Ice chair became innovative compared to the other stocking chair in Fritz Hansen, because you could also use outside. But of course several chairs in Italy have already this in their specification and in their concept. So it is always very important when you produce and want to develop new design furniture, that you bring in new challenges in the briefs. People in the '50s like Arne Jacobsen or Eames and their manu-*

factures, like Fritz Hansen and Knoll, were able to come up with such challenges. Why not use aluminium like aluminium is used in the airplane, why not use a new principle. That's help the designers to design something that has innovative features, and that's very important if you want to be taken seriously as designers and furniture manufacturing, every time you are introducing a new kind of furniture there has to be something in it that is truly innovative, otherwise what you are bringing out, people can say: this is only another stackable chair, why would I want to buy just another one?[335]

The product development process was translated into narratives to be told during the launch of the chair, translated it into figures, texts and illustrations.

Fritz Hansen did a lot of good things with the Ice chair, and one of the things he really did well was he wan some very good marketing. They really emphasised to put in a market like a big bang, at the fair in Cologne in Germany, they booked all the square meters and then they took away everything, and they didn't want anything else than the Ice chair. For all the 300 square meters, I don't remember how big it was, but they only put the 150 Ice chairs and everything was white but the black Ice chair, the black Fritz Hansen, it was very clean, the mention was Ice, very clean and simple. So I was lucky to come in at the time when Fritz Hansen was learned a lot on what they did before. Before they had all the furniture on the fair, and they had very good food for the people coming in, very good wine, very Italian way of selling the things, and it's a nice way still, it's a nice way to invite people. They found out that business is business and people are coming here to buy furniture, right?[336]

The vision of the top management team in Fritz Hansen was clear: making a product that could be displaced and travel everywhere, in all the environments of the houses, in different buildings, and also outside. The risk was high, since the chair could be interpreted as a chair that was suitable for anything and nothing, and being not commercialised for the lack of an interessement of the customers. Moreover, Salto at the beginning had difficulties to conceive a balanced chair in that sense: an outdoor chair should be

[335] interview with the former design manager
[336] interview Kasper

durable, resisting enough for the rough Scandinavian environment; an indoor chair should be soft, smooth and warm, it shouldn't be too heavy, nor too cold. Salto worked in the prototype in his studio but constantly interacting with the team in Fritz Hansen, bringing it to them when he though to have advanced in the modelling. He was enthusiastic in working with the plastic, a new material for him, too expensive to experiment without a commission. According to Kasper Salto, the chair resulted to be an excellent chair, very high tech, maybe a bit expensive to be commercial; however, the chair resulted so high tech that it scared some of the targeted market. It was presented as precise chair, not cosy or warm. The plastic chair was made of plastic and aluminium, materials that are supposed to last for long time, but the elaboration and the way of moulding them were new for both Fritz Hansen and Kasper Salto. For three years, Salto worked only on this project. The final prototype was produced, and Kasper Salto won the competition with his chair. Jacob Holm, the CEO, asked that the design should be scaled 4–5% compared to the first prototype. Commenting on the design process, the former design manager affirmed:

> *I think that is something that is high quality in Fritz Hansen, that is the designer is asked to interact during this process. In other companies typically the designer comes in, make the design and after three months he gives the hands over to the company, maybe it is invited to the introduction party. But Fritz Hansen doesn't think it is the proper way to behave: Fritz Hansen wants the designer to be part of the process, to ensure that the product gets as good as possible, that the designer feels and accepts the product as much as possible, so he can become a good ambassador for his new product. The brief has to be brilliant, highly original, the designers have to be good to be able to develop new products, and of course it's a challenge to bring new aspects in the future products that can make them stand out to the all classics. Nowadays everybody has a moment to talk about the environment, pollution, reducing the energy (...) it's always a question of finding he right compromise.*[337]

Salto commented on the launch strategy of this chair compared to the launches of furniture. After initial presentation of the chair in the company, the marketing director of Fritz Hansen organised a campaign along with launching the chair at the fair in Cologne in Germany, booking a 300 square

[337] interview with the former design manager

meters space and displaying only 150 Ice chairs and cubes of ice everywhere. For the first time in a launch campaign, the concept of the launch event was altered; no fine food or wine was served, the main actors were the chairs with the designers

> *There were a lot of people in the old days that drank this nice wine, ate this nice food but nothing came out of this, no business was there comparing to how many people came in so they. It turned around and said: who are really business partners? And the people that came inside they asked: what we can drink here? And the only thing they could have was water, water with ice, so they got sorted out who is our real friend and who is friend because we have this, with food and wine. I though it was very cool, they really focused on, the made a plan. A strategy plan on how to approaches the market in the future and after that they totally stopped to focus on fairs, few years after they totally stopped to attend fairs on the fairground they still have in Milano their own show and all around the world, but very focused. And I was lucky to be actually the first one the first new designer with the first new product to come in that way f dealing with the market, and I can see what they did, they kept the Ice chair the new, the number one, new item from Fritz Hansen.*[338]

Spokespersons The spokesperson for this episode was Jacob Holm. Kasper Salto was a macro-actor representing the his studio and the actors involved in the design process.

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept and develop the Ice as new chair to launch the concept of the Republic of Fritz Hansen.

[338] interview with Kasper

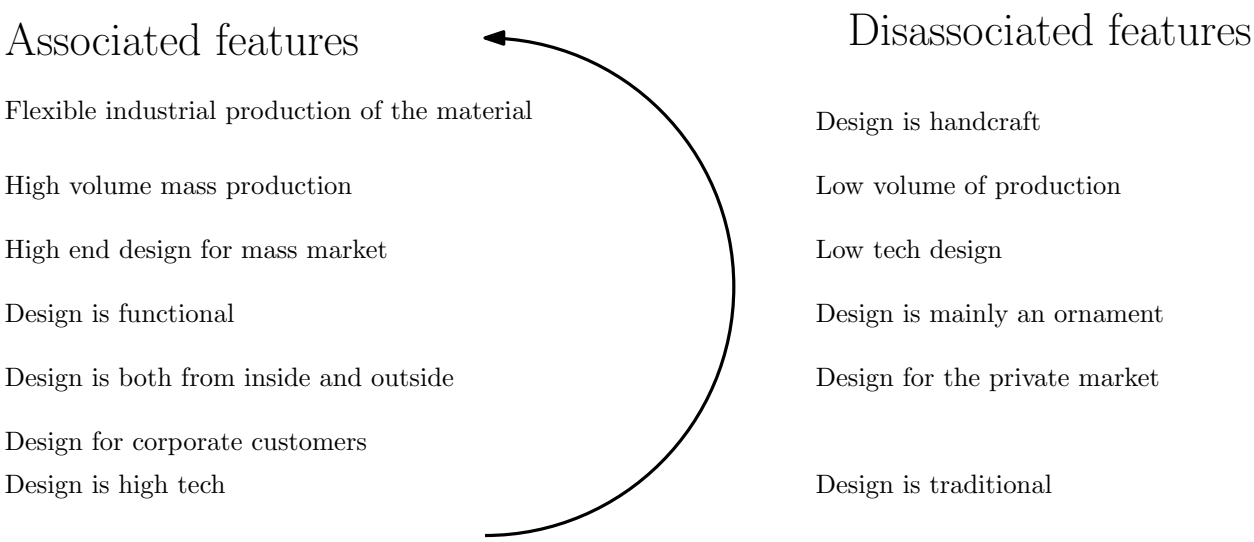

Figure 5.42. Design features as an outcome of choices, in the first episode. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the programme of action of the developing the Ice Chair.

The features associated to the Ice were related to the design suitable for industrial production. It should be functional with the ability to work both indoor and outdoor and suitable for manufacturing for mass production. The target market was principally private customers, but also included corporate customers. The disassociated features could be considered for another Danish chair, classical, not breakthrough, cabinet-maker and low-tech. In order to reinforce the idea that it was a product breaking from the past, the market introduction was done in a new way:

> *This was for an original introduction, part of the all launch of the chair was done with putting the chair in the ice and there was the competition. Whoever was there where the ice was melting ... doing things like that. This is not only a brochure on the Ice but Ice was done to mark a new period, something to move forward, because this was the first thing we have ever done in plastic and also look very different from all the other designs, so this was something meant to mark a new beginning and also meant to show Fritz Hansen being brave because this was coming out from a dark period*[339].

[339] interview with the brand manager

5.4.2 Episode 2: The Growth in sales of the Ice

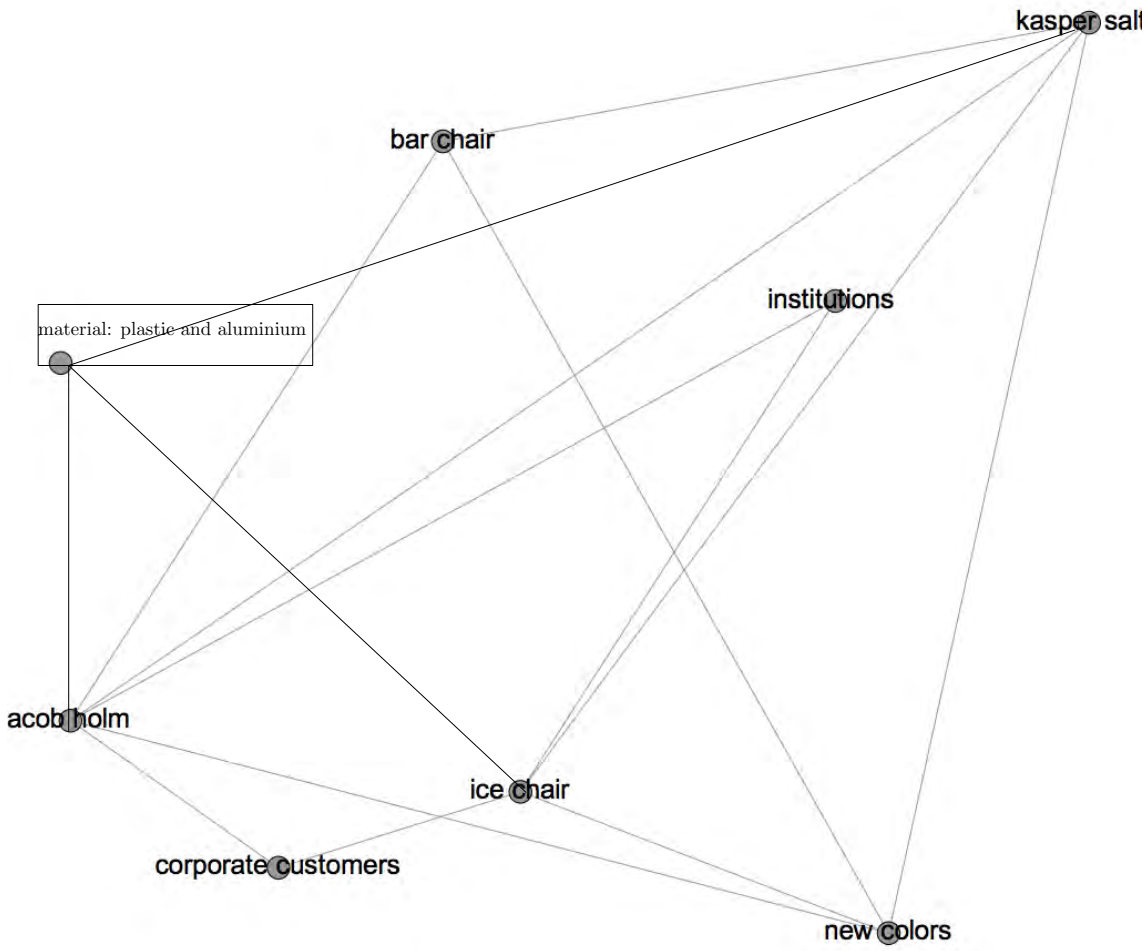

Figure 5.43. Allies in the network, in the second episode. Network showing the allies enrolled and their relationship in the second episode, during which the sales increased.

The analysis of this episode is focused on the periods preceding the presentation of the Ice, a chair designed by Kasper Salto and manufactured by Fritz Hansen, introduced at the in 2002

Allies in the network The following table represents the allies in the network that supported the development of the Ice.

Kasper Salto	Former design manager	Jacob Holm	competition
material used for the chair	prototype	bar chair(higher legs)	laboratory

Table 5.14. Allies and black boxes in the network of the Ice, in the second episode. The allies in the network in blue are human allies, the red ones are non human allies and the black one is a black box.

Translations, mobilisation, enrolment The following figure represents the translations that lead to the development of the Ice chair.

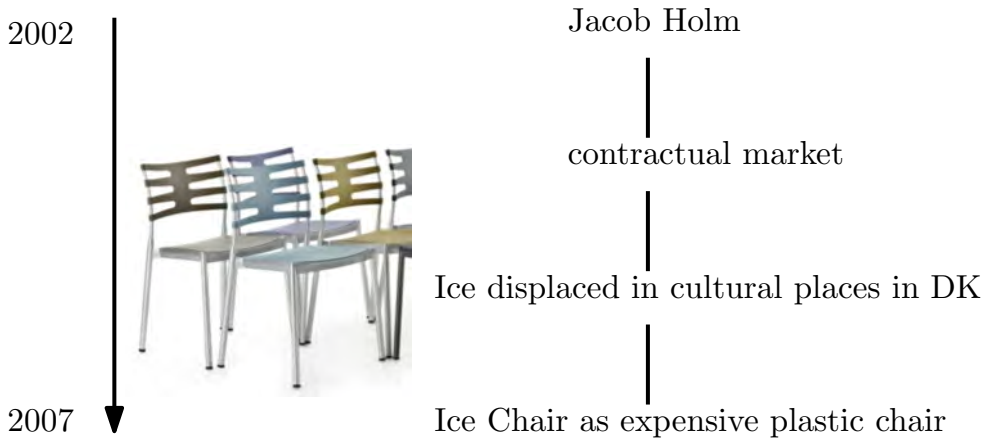

Figure 5.44. Translations, second episode. Overview of translations that Jacob Holm initiated to stimulate the increase in sales.

> *So it was really a good idea to introduce the ice chair, designed by a young and unknown Danish designer, Kasper Salto. So, there was a really good reception in Denmark for the Ice Chair, while in other countries it did really not became successful. But in Denmark there was definitely a big interest and a high level of acceptance, because this was a new interesting chair from a young designer for the market. Because there are so many Serie7 chairs in Denmark, everywhere you see them, it was very nice for people to have an alternative from the same company, Fritz Hansen, and that has been a very important role of the ice chair over these years.*[340]

The financial crisis was an actor that destabilised the network, because the customers were not willing to buy new furnitures but to invest in the classics.

Fritz Hansen has used Kasper Salto to promote the chair:

[340]interview with the former design manager

Fritz Hansen has used a lot Kasper all around the world to give lessons to architects, to dealers, journalists, I think that is very important, because of course designers are kind of stars, people like to read about designers, and designers are certainly needed.[341]

The Ice has been displaced in many institutions, corporate buildings, and museums.

Other Danish companies like Bang and Olufsen and Poul Kjærholm the lamp company, I am sure they have paid American companies to have their products in movies, but never Fritz Hansen, ok, maybe we have paid for having the furniture produced, but afterward having the furniture back, but never paying, and that helped a lot to widespread the knowledge of the product. Nowadays there is every Sunday evening at 8 o c'clok, there is a TV series, in the Danish television, have you seen that? Oh my god, I can imagine it can be difficult to look at Danish television, but it is about politics, you know the Danish parliament. In the office of the prime minister, there is a conference table, and around the conference table, luckily, there is I think, around 12 Ice chairs. So every Sunday night there is free promotion for Fritz Hansen for almost an hour, because for one hour they sit on that chair and they'll stay there to talk, and this helps a lot. But again with the Ice chair it is only a Danish phenomenon, not international. I really hope the Ice chair could survive many years from now, but I am not quite sure, whereas I am quite sure that the Serie7 and PK 22 they will leave for ever.[342]

Spokesperson Jacob Holm was the spokesperson, while Kasper Salto acted as a macro-actor, able to convey and transform information.

Features associated and disassociated The following figure depicts the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept and develop the plywood as material for the furniture industry.

[341] interview with the former design manager
[342] interview with the former design manager

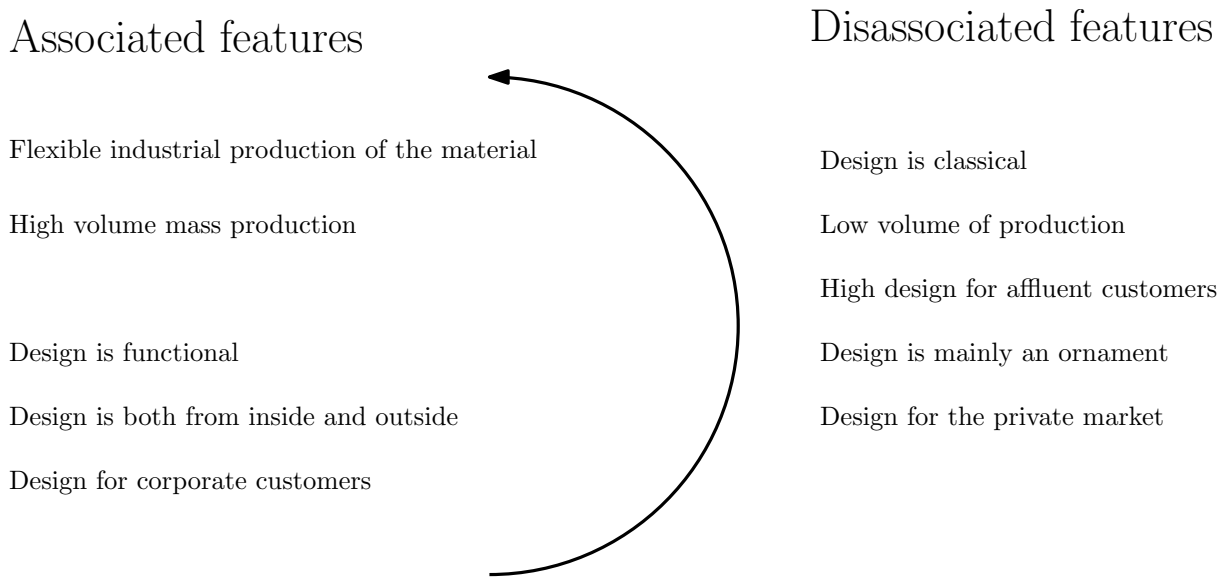

Figure 5.45. Design features as an outcome of choices, in the second episode. Representation of the process of inclusion and exclusion of the features the spokespersons worked for and against to support the program of action of increasing the sales of the Ice, third episode.

5.4.3 Episode 3: The Decline (2007-2012)

The analysis of this episode is focused on the period in which the sales dropped for the Ice, a chair designed by Kasper Salto and manufactured by Fritz Hansen.

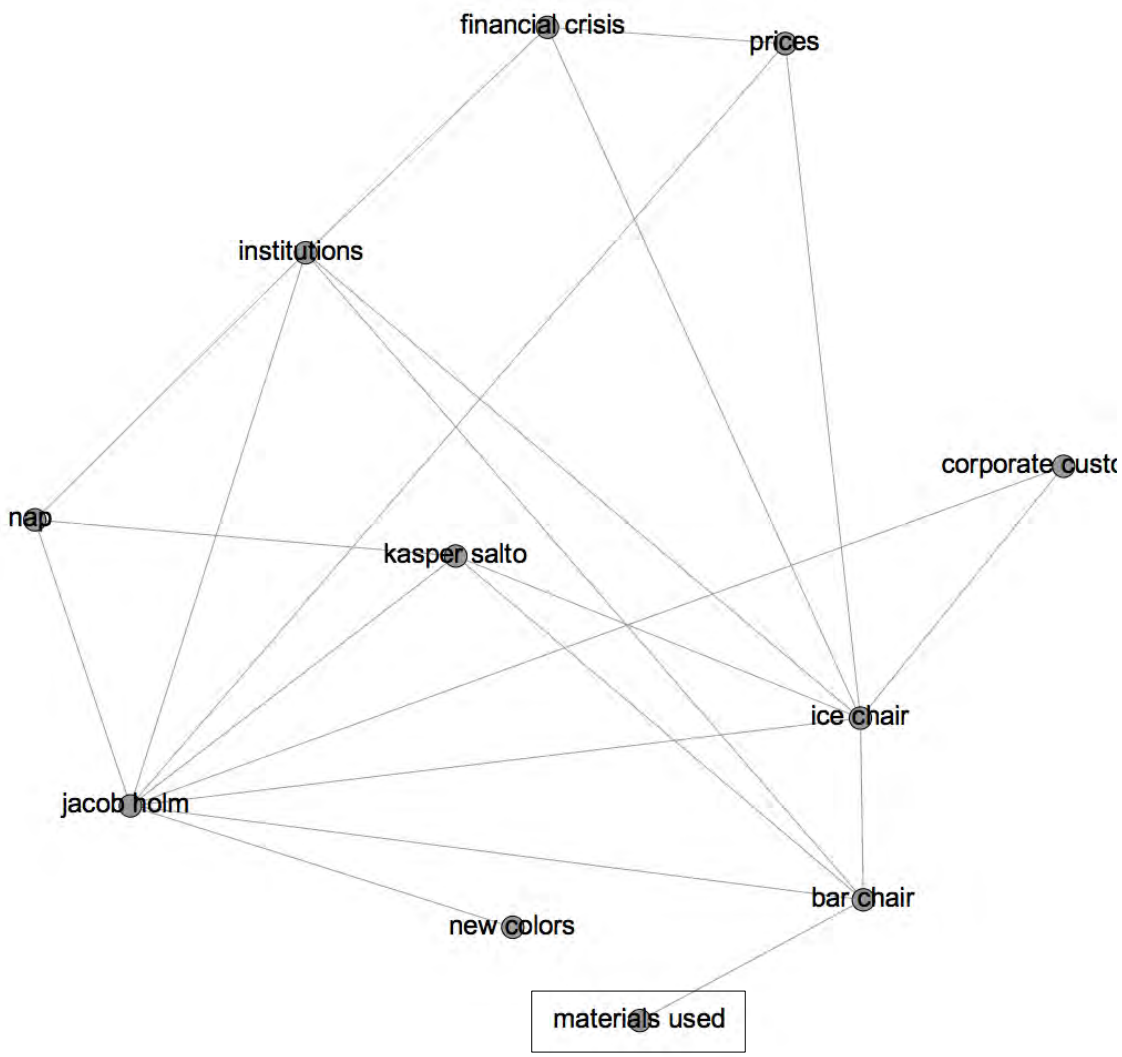

Figure 5.46. Allies in the network in the second episode. Network showing the allies enrolled and their relationship in the third episode, during which the sales increased.

Allies in the network The following table represents the allies in the network that supported the development of the Ice.

bar chair	corporate customers	financial crisis	new colours
Kasper Salto	Jacob Holm	financial crisis	institutions
material used	nap chair	new colours	prices

Table 5.15. Allies and black-boxes in the network of the Ice, third episode. The allies in the network in blue are human allies, the red ones are non human allies and the black one is a black box.

Translations, mobilisation, and enrolment The following figure represents the translations that lead to the development of the Ice chair.

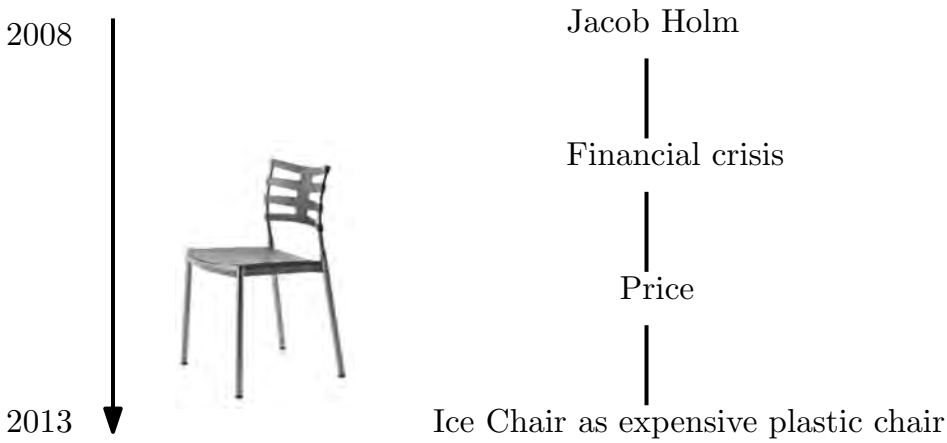

Figure 5.47. Translations, in third episode. Overview of translations initiated by Jacob Holm through which the ICE chair went but resulting in decreased sales.

The sales went down, because the network became smaller and with fewer supporters. The chair was sold mainly in the Danish and in the American contract market, but not sold in other countries (only through the website) because of the high cost and the availability of cheaper and more known chairs. There was a big reception in the launching of the chair in the market.

> *So, there was a really good reception in Denmark of the Ice chair, while in other countries it did really not became successful. But in Denmark there was definitely a big interest and a high level of acceptance, because this was a new interesting chair from a young designer for the market. Because there are so many Serie7 chairs in Denmark, everywhere you see them, ok, of course it was very nice for people to have an alternative from the same company, Fritz Hansen had a very important role of the Ice chair over these years. Now there is also an alternative to the Ice chair, the Nap chair, and maybe people say ok the Nap chair is half of the Ice's price, therefore the Ice chair suffer very much because it is a quite*

expensive chair, like the Serie7 chair, it is even more expensive of Serie7 chair as far as I remember. [343]

The Ice chair was considered a success from the design manager's point of view:

> *the Ice chair has been 11 years in the market and it is a lot for a plastic chair, and it would be wonderful if it can continue of course. We will see, we are not planning to take out from the collection, so maybe will be revitalised one day. A couple of years ago we made new colours, for it, and it adds a new life to the chair, it gave a new energy.*[344]

It was revitalised with new colours, designed by the wife of Kasper Salto. However, due to the price and competition, the sales of the Ice had been decreasing. The market for the Ice was mainly contractor in Europe and in USA. Even if the sales were decreasing, the company was keeping it in the collection as

> *Today, we have close to 50-50 on the retail and contract market. In the '80s and '90s we were very contract focus company and we were struggling in terms of selling (. . .)he introduced the concept of The republic of Fritz Hansen to signal something new, to re-brand the company and yeah. . . so... and in that's same period, the ice chair was also introduce, and that time, Kasper was a very young designer. Well, he is still young because he is in his 30s and we tend to describe him as young designer, but at the time he was very young, ten, 11 years ago, almost 12 years ago, he was at the beginning of his 20s and it was the first time that we have taken someone so young and not established and we took the chance. It has been also ice-breaker and he was used to communicate something on the future. This is why we like to keep in our collection.*[345]

The financial crisis was an actor that impacted negatively on sales, because during a financial crisis, people tend to buy classical

> *People want to buy the classics, not new products. When we are talking about Arne Jacobsen and the classic furniture, like PK*

[343] interview with the former design manager
[344] interview with the design manager
[345] interview with the brand manager

22 and Serie7, there is also a very strong second hand market, it means that if you buy a new chair, you can always sell the chair, maybe you can never have the original sum of money back, but if you are buying Arne Jacobsen chair, you can have maybe half of your money, of 60% of your money back. While if you buy an Ice chair you can maybe get a 10th. That is seen a much more better investment, because there is a much stronger second hand market, do you understand? It is like for the car market, it is like a used car, if there is not interest, then the price goes down, but if there is an interest from the market for the product, it is like the Iphone, you can sell your, young people if they need money can still sell their and get some money, it is a product that many people would like to have, but they can't afford, it is a kind of product that young people would like to have, and they want to buy a used phone, so many people would buy a second hand Serie7, the Egg, the Swan, and therefore there is, that talks again for high sales also in periods where the financial stability is very low and there is an international crises, you tend to get back to the classic, you tend to invest in the classic, whereas in the good time, people have a lot of money and people also in south Europe have a stability, so people allow themselves to invest in new and unknown product, and this is very important, especially when you look at design and furniture office.[346]

Spokesperson The spokesperson of this period was Jacob Holm. Kasper Salto was an actor, not a macro-actor for the Ice chair; he did not act to translate information after the introduction in the market, he designed for different firms, scopes and items, he lost interest in the chair and his fate.

Features associated and disassociated The following figure represents the arguments for which the spokespersons were working for (inside the arrow) and working against (outside the arrow) to interess the allies in the network to accept the Ice chair.

[346]interview with the former design manager

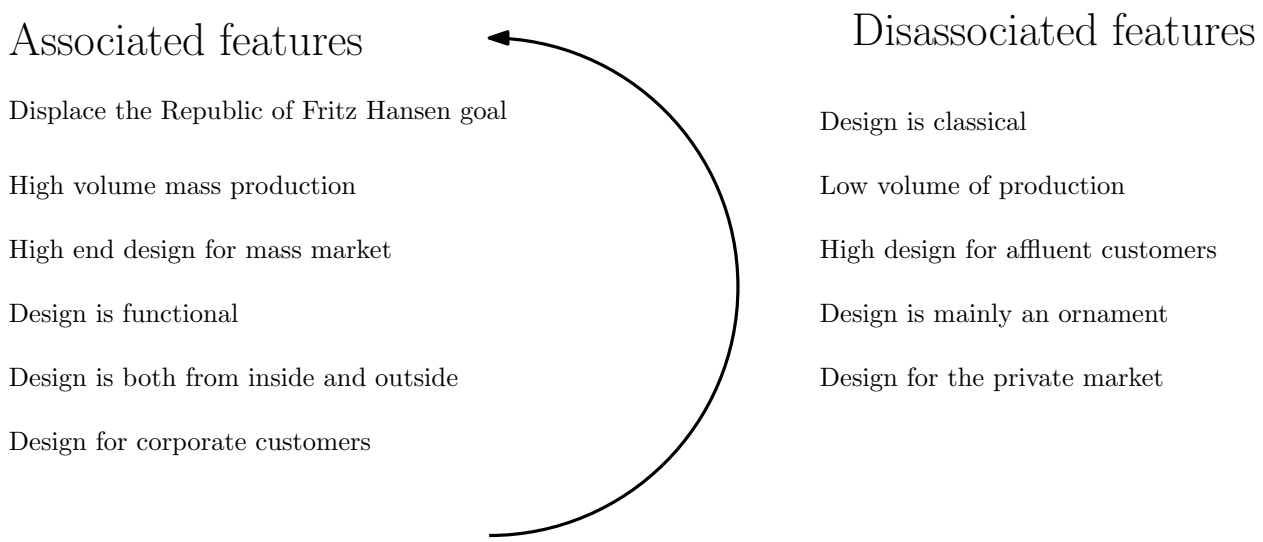

Figure 5.48. Design features as an outcome of choices. Representation of the process of inclusion and exclusion of the features that the spokespersons worked for and against to support the program of action of adopting (and adapting) the plywood in the furniture industry, after the Second World War.

The features communicated by the company were strong and resistant.

> *This chair in plastic is different from the Serie7, it is made in plastic and aluminium so the chair can work also outside in doors and outdoors. It was design wise, it doesn't look as anything in the collection. A lot of people though it looks something very strange in Fritz Hansen collection but it has character, it has some values it has very high quality, very refined, and also long lasting because it does not look like anything else, it is not part of a trend or of a category, it is quite valuable actually, it is made of plastic and aluminium and aluminium it is a material very easy to recycle, but it takes a lot of energies to manage it. It is again a balance. Some people could say that aluminium is not so good to use as raw material, but if it is recycled it is much better.*[347]

The features associated and disassociated were not perceived by the customers or the retailers, because they perceived the chair similar to the IKEA chairs and did not understand the speciality and the high prices.The former design manager answered to this problem stating the following reasons,[348]

> *because I think people in other countries have other alternatives. There are other modern chairs, using aluminium and plastic, why*

[347]Interview with design manager
[348]interview with the brand manager

should I buy the ice chair, whereas in Denmark it is a chair from a Danish manufacture, and it is a chair from a young and sympathetic designer, yes we like the company, we like the design, therefore we like the chair. It was much better received in Denmark than in other countries. In Germany you have the German and Italian chairs of high standard, modern design, high quality, so it is easier to pick them instead of the Ice chair. It is not totally unique in its concept, internationally, that it is how people perceive it, I think. Therefore the situation with Kasper is totally different from Arne Jacobsen, and outside Denmark they don't know who he is, therefore the furniture don't sells automatically, it is not like Arne Jacobsen where a Egg is a Egg, he is not famous outside Denmark.[349]

In Denmark, consumers could see the Ice in many public institutions (CBS, DTU, KU, Louisiana museum, for example), even at TV shows, increasing its displacement. However, outside Denmark, the chair was unknown and not sold. The communication manager tried to give an explanation on why the features associated were not very visible, and the actors in the networks had difficulties in understanding them.

The design of the Ice chair is more time specific than some of our products, and it is perceived a little bit as '90s and it is more technical, it is not so easy we could say visual to interpret than some of our products, so I think it has been part of that and for a period of time, in the past 10 years, we have introduced so many new products that it is also difficult for us to maintain attention on all products and the ice chair is one of those who suffered more. I can't say how much would be different if we would have kept a focus on that, but I think... I mean... probably something could have been different. The fact we have introduced the nap chair, probably would not help the Ice chair. The Ice chair is also fairly more expensive than it was used to be... and it is probably part of the question... and part of the question is also whether it is not marketed in the right way, you can say the Ice chair is the only product we have that it is able to work both indoor and outdoor and I think would be relevant to investigate if it would be more successful like an outdoor furniture because if you compare with some of our indoor furniture, it does not really compete. It

[349] interview with the former design manager

only competes for the fact that is light weight chair, other than that is it. It is very masculine product, many of our designs are in some way feminine in terms of shape... not in terms of colours because it is up to the customers to choose, but in the shape. So no major events for the Ice chair[350].

Therefore, the Ice chair was perceived as difficult product, complex, novel to communicate and to be understood. Salto was not working actively to promote the chair, not speaking on behalf of it, and the sales decreased considerably; it was difficult to find information about the ICE even in shops that used to sell it.

5.4.4 Conclusions- Ice chair

The Ice, a plastic chair, was designed by mobilising the brief as managerial technology and through a process of mobilisations and translations. During the first episode, the Ice chair was developed, the second episode saw increase in the sales because of the enrolment in the network of corporate customers. However, in the third episode, the network became fragile and the actors started to lose interest in it. Compared to the other two design previously analysed, the spokesperson and the other actors in the network are not working for defining a strong programme of action, the goals are not clear, the designer is not acting anymore as a representative of the chair. In the last episode, the spokesperson is not working for framing the customers on the features associated or disassociated, they are seldomly explained. The chair is a difficult chair, the customers, unless they have interest in the design, could not understand the reasons of the high price, what is special in that chair, therefore they are resistant in being enrolled and the efforts made for convincing them are feeble. In the following table, the episodes are summarised.

[350] interview with the communication

Table 5.16. Episodes of the Ice summary of the empirical study of the Ice.

	Allies in the network	**Translations, enrolment, mobilisation**	**Spokesperson**	**Features associated and dis-associated**
Episode 1: The design of the Ice (1997-2002)	The network is heterogeneous, but not many actors involved	The translation process, initiated by Jacob Holm, which lead to the development of the Ice, through the translation of the brief	Jacob Holm; Arne Jacobsen was acting as macro-actor	Jacob Holm worked for supporting the features of being suitable for being indoor-outdoor chair, resistant to the weather, not a chair as ornament, or for private customers.
Episode 2: The Growth in sales of the Ice	The network of allies is growing in the institutional clients, new colours of chairs and shapes have been introduced in the market	The translation process, initiated by Jacob Holm was not long, and it lead to displace the chair as expensive plastic chair	Jacob Holm	The features associated and dis-associated in this episodes are similar to the one associated in the first episode
Episode 3:	New actors emerge and they destabilise the network, as the financial crisis, new chairs that are less expensive and less high-tech than the Ice	The chain of translations is very short, and it lead to increase the price of the chair because of the financial crisis	Jacob Holm	The features associated and dis-associated are similar to the one of the previous episode

The theoretical implications of the analysis will be discussed in the conclusion of this chapter, with a cross-case summary, and expanded in Chapter 6.

5.5 Conclusions of the analysis

The following research questions were answered in this chapter:

1. For each design object (Serie7, Egg, Ice):
   (a) Who are the actors in the networks?
   (b) What translations, mobilisation, enrolment, spokespersons can be identified?
   (c) What are the features of the products that are associated and disassociated?

The analysis demonstrated, by studying different episodes of the PLC of the objects, how a design emerges as a network effect through the translation process and how many different humans and non humans actors contributes to its development, its success and displacement, in which all the mobilised actors had a mediating role.

Who are the actors in the networks?

The actors in the network were a heterogeneous group of allies including human and non-human actors. In the tables in the analysis, the mediators, the black boxes and the leaky black boxes were reported. The technical and social aspects were also analysed in the same way. The figures with the networks were an inscription to visualise the complexity and the density of the network, and the links were created by following the actors, looking in the data who enrolled which actor. In the analysis, however, not all the actors were reported, because they could be potentially infinite. The network that was drawn represented a simplified reality, since they were networks of simplified entities which in turn were other networks (Callon et al., 1986). The allies were not remaining fixed from of network to another one, they were not pre-constituted elements, but they were constantly modified by the translation process. When some actors left the network, the spokesperson and the mediators work for enrolling new ones to make the network less fragile and more stable.
The networks drawn in the analysis contribute to show the complexity of the network, how many actors were entering in the process. In the period of high sales, the network was numerous, the translations were successful, the goals and the programme of action clear. In the period of low sales, the actors were detached from the network, the spokespersons had difficulties to translate their goals and attract new actors in the network.

The importance of the spokespersons is related to the size of the network they are representing, which appear crucial for the translation process and the value creation process. Latour (1987) argues that the spokespersons are objective or subjective (depending on their capability of speaking on behalf of others), and their importance depends also on the strengths of the relationships. However, it was not possible to elaborate more on this concept, and it will be left as question for future researches.
Even if it is common to say this chair has been *designed by* Arne Jacobsen or Kasper Salto, the analysis demonstrated that they were the representative of a endless number of actors that participated in the design process, from collaborators at work, to all the tools for designing, from the smiths preparing the prototypes to the materials used and the machines for producing it. Arne Jacobsen and Kasper Salto are the representatives of the network, as meant in this quote:

> *A difference in relative size is obtained when a micro- actor can, in addition to enlisting bodies, also enlist the greatest number of durable materials. He or she thus creates greatness and longevity making the others small and provisional in comparison* (Callon and Latour, 1981, pg. 284).

However, the designer was not a single individual but a collective group of actors contributing to the fate of the design and its chances of success (Akrich et al., 2002b). They gave shape to the design during the process, transformed it until a market was built and constantly convinced other actors to be enrolled in the network and the customers to buy it.
From the analysis, in order to identity the allies in the network, it was applied the following rule:

> *Instead of dividing the subject with the social/technical, or with the human/animal, or with the micro/macro dichotomies, we will only retain for the analysis gradient of resistivity and consider only the variations in relative solidity and durability of different sorts of materials* (Callon and Latour, 1981, pg. 284).

Therefore, the allies identified were the macro-actors, the spokespersons, the mediators, the black boxes and the leaky black boxes. A black box was an intermediary, an actor that did not need to be questioned, the content was taken for granted, it no longer needed to be reconsidered. The leaky black boxes were individuated when an actor was considered a black box, but with margins of negotiations. The leaky boxes, indeed, were black boxes

not totally closed, and the managers could act upon them to stabilise them; managers mobilised and used them as managerial technologies to transmit information, take decisions in an unproblematic way. There were struggles for closing the leaky black boxes and they required a different intensity for the negotiation. For example, the veneer was stable, black boxed, readymade, but when an incremental innovation happened, it became leaky, because it slightly changed and the manager had to work for closing it. The black boxes allowed managers and other actors to mobilise them, to enrol other actors in the network, to solve controversies without being questioned too much. For example, Scandinavian and Danish design were black boxes, because it was agreed on their meaning, on the features they were associated with them, and could be mobilised also in other episodes and for other designs.

> *What translations, mobilisation, enrolment, spokespersons can be identified?*

From the analysis, it is evident that the translation process played a critical role in the enrolment process; it led to associate and disassociate features about the design. The spokesperson worked on translating the features to the network, while the designer worked for mediating them to the allies; together, they contributed to strengthen the network of allies. The following table represents the translations for the Serie7 in the different episodes:

Episode 1(1)sub-episode-	plywood- Alvar Alto (hand-craft); prototype- Eames and Saarinen- Eames Chairs - organic design)- modern manufacturing- MoMA- plywood as material for modern manufacturing
Episode 1(2)sub-episode	Arne Jacobsen- canteen in Novo Nordisk- Søren Hansen- Eames Chairs - organic design- Plywood- Modern Manufacturing - Ant
Episode 1(3)	Ant- complaints of the customers on the Ant (armrest; four legs)- Arne Jacobsen- DAN chair- Søren Hansen- organic- ergonomic- Serie7
Episode 3	Serie7- Danish Design- Søren Hansen- Scandinavian Design- Mass manufacturing- export- other plywood chairs; 3102; 3105; 3107; 3108; 3123; 3187; 3130
Episode 3	Peter Lassen- Furniture dealers- USA - Europe- oil crisis- veneer/ wood-sustainable- quality and resistant Serie7 chairs; Arabian countries- oil profits-new buildings- Danish Chairs-quality and resistant serie7 chairs
Episode 4	Jacob Holm- Republic of Fritz Hansen- prices- artists- Serie7- exhibitions- classic Scandinavian design

Table 5.16. Serie7: Translations.

The following table represents the translations the Egg went through in the different episodes:

Episode 1(1)sub-episode	Norwegian Engineer- Molecular- USA army- Eames and Saarinen- Chairs - organic design- modern manufacturing- Styropor as Modern Manufacturing
Episode 1(2)sub-episode	Arne Jacobsen- Eames Chairs- Landmandsbaken chair -Modern Manufacturing- Styropor- Søren Hansen (modern manufacturing)- SAS hotel- Egg and Egg and Swan
Episode 2	Søren Hansen- Egg- Exhibitions- Danish Design- Export- Hotels/ Buildings/ Lobbies- Egg
Episode 3	Peter Lassen- Furniture dealers- Egg- USA- oil crisis- plastic materials not good- Egg not sustainable and elite chair
Episode 4	Jacob Holm- Republic of Fritz Hansen- prices- Golden Edition- Tal R- Egg as piece of art - exhibitions- Egg as timeless/ iconic design
Episode 5	Jacob Holm- emergent market- prices- catalogues- Furniture dealers- egg as exclusive

Table 5.17. Egg: Translations.

Episode 1	Jacob Holm- design manager- brief- designers- prototypes- Kasper Salto- Ice Chair
Episode 2	Jacob Holm- contractual market- ice displaced in cultural places in Dk- Ice expensive plastic chair
Episode 3	Jacob Holm- Financial crisis- price- Ice Chair as expensive plastic chair

Table 5.18. Ice:Translations.

When the chain of translations was longer, the design was better accepted, and the allies agreed to work for it, showing a higher displacement, drift, invention, mediation, the creation of a link that was non- existent before and modified two elements or agents that to some degree (Latour, 1994, pg.32). Therefore, when many links are created, higher is the likelihood that the programme of action is understood by the different actors and mediated successfully. The translation also allows to construct a larger network. When some actors were leaving in one episode, the spokespersons worked for replacing them to impede the falling down of the network. The spokesperson also mobilised and delegate functions to the non-human actors to successfully enrol humans in their program of action (Latour, 1991). In the analysis, the weight of what counts or what does not count was never pre-determined (Latour, 1991), but was the result of the translation process. The spokespersons directed this process.

In all the episodes, the identified spokespersons for the design were the managers of the companies where the design was produced. The spokespersons used the black box as fixed frame to align, enrol and negotiate the interests of actors (Latour, 1987), as well as to enrol them in the construction of facts (Latour, 1987). The spokespersons are also initiating the value creation process by associating and dissociating some features. They could

act upon the leaky black boxes by woking for closing them and take decisions on what to insert in them to make them manageable.

> *By stating what belongs to the past, and of what the future consists, by defining what comes before and what comes after, by building up balance sheets, by drawing up chronologies, it imposes its own space and time. It defines safe and its organisation, sizes and their measures, values and their standards, the stake stakes and rules of the game* (Callon and Latour, 1981, pg 286).

The above quote is referring to a macro-actor, but based on the analysis, it is interpreted referring to Søren and Fritz Hansen, Peter Lassen and Jacob Holm made decisions and acted so they bended the space around them, closed opened black boxes, defined a programme of action that the actors adhere. They also managed the struggles that entered the network and destabilised it, making some actors leaving the network, detached, not interessed in the design anymore. When this happened, they worked for stabilising the network, capturing durable elements and create stable relations, avoiding allies to escape in different directions, tightening them to the network so it would not fall apart and hereby lose the design object.

> *What are the features of the product that associated and disassociated?*

The features associated and disassociated in the first episodes of the all the three chairs were similar. The chairs were associated with the features of being modern, mass produced, high design for large number of persons. However, during the episodes the features associated and disassociated changed, modified; some features, which were associated in an episode, were disassociated on that the following one. For example, in the first episodes, the Egg was considered as an ultramodern chair, suitable for mass manufacturing. In the fourth and fifth episode, the Egg was considered handcrafted, finished by hand. In the Serie7, the first episode was associated with mass manufacturing and industrial production, but later it became green, sustainable, made of wood. This indicated that the market was not determined, fixed and immutable, the features were not given nor embedded according to the tastes of the customers, but they were framed.

The results obtained from the analysis are discussed in the next chapter and related to the literature review to discuss the managerial implications.

The following table summarises the features associated and disassociated for the Serie7 in the different episodes:

	Features associated	Features Disassociated
1sub- episode- design of the plywood	Flexible industrial production of the material, high volume mass production high en design for mass market, design is functional, lower prices for each item	design is conservative, low volume of production, high design for affluent customers, design is mainly an ornament, high price
2 sub-episode- the design of the Ant	suitable for small spaces, stackable, smaller chairs, cheaper design, high volume mass production, functional design, modern mass manufacturing, modern industrial destine, suitable for working places, low working time per design	big and large chairs, expensive design, ornament design, designed by cabinetmakers, limited production, limited market, high working time per design
3 sub-episode: design of the Serie7	ergonomic design, high quality, cost reduction, modern industrial manufacturing, high volume mass production, high end design for mass market, lower price, stackable, lightweight, suitable for working places, functional, organic, innovative, quality in the industrial production	design is uncomfortable, design is handcraft, cabinet maker, for a limited market, limited number of design produced, produced of bent wood, expensive, heavy, suitable only for few environment, ornamental, straight lines, conservative, quality in the craft production.
2 episode: market introduction	original, representing Danish design, high volume mass production, quality, exportable in many different markets, mass manufacturing	plagiarism, cabinet maker, production for a small market.
3 episode: the increase of sales	sustainable design, comfortable design, high quality through industrial production, classic design, long lasting	design using materials not environmentally friendly, breakable and low quality, pop design, fast consumption-frequently changed
4 episode: the decline	sustainable design, scandinavian design, design for private market, honest design, designed by Arne Jacobsen	design for a mass market, design for the corporate market, designed by a cabinet maker

Table 5.19. Serie7: Features associated and disassociated.

The following table summarises the features associated and disassociated for the Egg in the different episodes:

	Features associated	Features disassociated
1sub episode- development of the Styropor	Flexible industrial production of the material, high volume mass production, high end design for mass market, design is functional, lower prices for each item	design is conservative- handcraft, low volume of production, high design for affluent customers, design is mainly an ornament, high price
2 sub episode: the design of the egg	flexible industrial production of the material, high volume mass production, high en design for mass market and design is functional and lower prices for each item	design is conservative- handcraft, low volume of production , high design for affluent customers, design is mainly an ornament, high price
2 episode: market introduction	original, representing Danish design, high volume mass production, quality, the design is exportable in many different markets, mass manufacturing	plagiarism, cabinet maker, production for small markets
3 episode: the decline	design using material non environmentally friendly, old design, classical design, long lasting	sustainable design, pop design
4 episode: the second life	handcraft design, design for status symbol, low volume of production, high end design for niche market, sculptural design , high price per item	flexible industrial production of the material, high volume of production, mass market, design is functional, low price per item
5 episode: the decline of the sales	sustainable design, Scandinavian design, design for private market, honest design, designed by Arne Jacobsen	design for a mass market, design for the corporate market, designed by a cabinet maker

Table 5.20. Egg: Features associated and disassociated.

The following table summarises the features associated and disassociated for the Ice in the different episodes:

	Features associated	Features disassociated
1 episode- the design	Flexible industrial production of the material, high volume mass production, high end design for mass market, design is functional, design is both from inside and outside, design for corporate customers, design is high tech	design is handcraft, low volume production, traditional low tech design, design is mainly an ornament, for the private market
2 episode- the introduction in the market	flexible industrial production of the material, high volume mass production, design is functional, design is both for inside and outside, design is for corporate customers	design is classical, low volume of production, for affluent customers, an ornament, for the private market.
The decline	Displace the Republic of Fritz Hansen goals, high volume mass product, high end design for mass market, design is for inside and outside, corporate customers	design is classical, low volume of production, high design for affluent customers, design is mainly an ornament, design for the private market.

Table 5.21. Ice: Features associated and disassociated.

As it is possible to see, some of the features were constant for the chairs in the initial and final episodes. When the chairs were in a situation of growing sales, the features associated and disassociated were similar. This might indicate that the associations were strong, the network stable, and there was not a compelling need for differentiating the products, positing them and addressing the chairs similarly to interest the target customers.
In the third episode, when the Serie7 was successful and the Egg unsuccessful, the features were specular. The spokesperson (Peter Lassen) was aiming at promoting the Serie7 and not taking too much care of the struggles in the network of the Egg. The objective was to maximise the sales of the Serie7 and maintaing the production of the Egg. The Serie7 was considered the item from which the firm could get profits, the Egg was considered an icon for the architects. The spokesperson worked for sustaining the Serie7; however, the features that were sustaining the sales of the chair were the opposite of the features of the Egg, which undermined the sales and destabilised the network. The actors oil price, petrol crisis, plastic pollution decreased the value of the Egg and destabilised the network. This demonstrates that the features were the result of the translation processes, of the work of the spokespersons to associate or disassociate them. If the customers are framed and accept them, they are willing to buy the chair. The tastes of the customers are not pre-given but co-constructed and constantly framed through the translation process. They are not a priori existing but they are built in the relationships. These were also the resultant of the network construction.

In the next chapter the results of the analysis will be presented from a theoretical point of view and linked to the previous perspectives: how this thesis is contributing to the previous perspectives in the literature.

The role of technologies of managing and the managerial implications are also discussed.

6
Cross Perspectives Learning

The discussion addresses the contributions of management of design as a translation process based on the analysis, to the literature review, presenting them in sections divided into design definition, design process, role of designers, role of management, value creation, and role of technologies of managing (Table 6.1). The aim of this chapter is to answer to the research question of having a a cross-case observations/learning based on the following questions:

1. Implications for theory (learning from ANT versus using other perspectives)

2. What is the role of technologies of managing in the process, and which technologies are mobilised and which are used to manage design?

3. Managerial implications (what does management mean if design is considered a network effect)

After the presentation of two tables in which the perspectives are summarised and linked to their constituent elements to enter the design discourse, four sections are brought up. These sections are based on the analysis, and are aimed to reflect on: (1) what we can theorise from the analysis in an ANT perspective; (2) improving the understanding of design, role of managers, designers, design process, value creation and technologies of managing for each perspective, by theorising the results of the analysis. In the analysis, management of design was a translation process. A translation is a

> *drift, betrayal, ambiguity. This means that we are starting from inequivalences between interests or language games and that the aim of the translation is to render two propositions equivalent.*

> *Second, translation has a strategic meaning. It defines a stronghold established in such a way that, whatever people do and whatever they go, they have to pass through the contender's position and to help him further his own interests. Third, it has a linguistic sense, so that one version of the language game translates all the others, replacing them all with "whatever you wish, this is what you really mean"* (Latour, 1988, 253).

The chapter proceeds as follow: presentation of the main philosophical building blocks of the perspectives and reflections on what design as translation process could add to the perspectives. In the Table 6.1, the philosophical building blocks are confronted with the philosophical terms, as it has been done in chapter 3, discussing the philosophical tradition they are based on, how they define metaphysics, what is ontology, essence, and substance. In table 6.2 the main characteristics are summarised, and they are the starting point for the learning from the analysis.

Metaphysics is the frame for investigating reality (Law, 2004) is the the frame on which the perspectives are based on, and the philosophical negotiation elated on:

> *metaphysics is traditionally defined as what comes after or above physics, thus presupposing an a priori distribution of primary and secondary qualities that settle the problem of the common world, the object of this book, too quickly. To avoid this premature solution, I call experimental metaphysics the search for what makes up the common world* (Latour, 2009, pg. 242).

The ontology is a branch of philosophy investigating what there is, what does the reality composed of (Law, 2004):

> *whether the "reality" to be investigated is external to the individual-imposing itself on individual consciousness; whether "reality" is of an "objective" nature, or the product of individual cognition; whether "reality" is a given out there in the world or the product of one's mind* (Burrell and Morgan, 1979, pg. 1).

The essence is a vehicle for individuating different forms of existence and different identity conditions.
The substance, in which the fundamental meaning of being is defined, answers to the question *why do things subsist?*. These are assumptions

> *about who they may be and what properties they are endowed with* (Latour, 1988, pg. 252).

The substance is what remains stable:

> *a substance is distinct from its relations, since it remains the same thing whether it is positioned three or fifty meters away from me* (Harman, 2009a, pg. 17).

Table 6.1. Comparison of the perspectives in management of design and their philosophical approach through the study of the metaphysics, ontology, essence.

	Philosophical tradition	**Metaphysic (search of what makes up the common world)**	**Ontology (what reality is)**	**Essence (properties that are endowed in the investigated thing)**	**Substance (what remain the stable, the same thing)**
Design as rational decision making	Pragmatism	Realism	Analysis	The essence is manifested in the complex systems	Systems designed for problem solving
New Product Development Process in Industrial Design	Positivism	Functionalism	Design is an outcome of the stage-gate system and sold with marketing efforts	The characteristics of the design are proper of the object, they are the inner kernel, they can subsist *in potentia*, there is an élan	Design object
Managing As Designing	Constructivism	Sense-making	Subjectivism	Managers are inspired by the designers, they are thrown in the organisations and they react creatively	Organisational structure- systems designed for problem solving
Design As Proposals Of New Meaning	Hermeneutic	Metaphors and citations	Designers as interpreters and proposers	Meaning	Discourse
Design as a translation process	Deconstructivism- semantic	Not a real metaphysic, but experimental metaphysics, as a method for investigating reality; based on the concepts of irreductions, inscriptions, modes of existence	Symmetry between humans and non-humans	There is no essence in the actors, it lies in the relations	Actors cannot be split into durable substances, unless they are black boxes which are durable until some other actor is opening them up; immutable mobiles

Based on the table, the following considerations are made.

The first perspective, *design as rational decision making*, is based on the American pragmatism which believes in realism: the reality is out there, external to the individual, tangible, concrete and relatively immutable, ontologically prior to the existence of the single human beings (Burrell and Morgan, 1979). Realism believes that

> *empirical and experimental investigation is unintelligible in the absence of an external world, and human capacity intervene in that world and monitor the results of their action, it argues that the world is composed of objects, structures and causal or other powers, and that it is the job of the scholars to offer revisable theories or hypotheses about these. A distinction is made between the powers or the empirical (what appears in experience), the actual (actions that occur when power structures are activated), and the real (that which is there, those structures and powers, and whether or not this is visible or activated)* (Law, 2004, pg. 158).

The perspective is based on the researches in the field of the decisional process in the organisations, and it affirms that in front of the complexity of the organisational interactions, having a decision making and a problem solving process based on rational processes is almost impossible. It is very difficult to aim at maximising the objective because the environment in which it operates is not perfectly known. That is why, Simon developed the concept of bounded rationality: managers can take decisions and solve problems, if they have proper training for using the designed systems to solve with the constraints of bounded rationality.

The second perspective, *new product development in industrial design*, is based on positivism, which looks for explanations and predictions of what happened and what could happen, hunting for causal relations between the different constituents to build up models to be followed in order to have an efficient system for the design process. Reality is tangible, not transcendental, and the aim of epistemology is to discover laws and rules, models synthesis, short descriptions of the reality in the organisations able to predict the future phenomenon, give useful information for human beings, which are ontologically superior to non human beings. Thus, the design is realised by following certain models (for example the stage-gate model) and widespread the object in the market using marketing tool. This perspective believes that there is an inner value in the objects that is embedded in them. The substance is

the design object considered as it is described in Plato: it is immutable, and at priori knowable with fixed characteristics.

The third perspective, *managing as designing* is built on the theories of Simon (1969), elaborating them with a philosophy based on constructivism, which is

> *the claim that scientific statements or truths are constructed in a way that to a large degree (in some versions totally) reflects the social circumstances of their production (...) Construction usually implies that objects start without fixed identities but that these convergence and so gradually become stabilised as singular in the course of practice, negotiation and/ or controversy* (Law, 2004, pg.157-158).

Managers are embedded in social structures and they have to make sense of the phenomenon by giving it meaning which are part of the local reality. According to the hermeneutics, this process is an interpretation on changing horizon and construction of stories that are plausible and interesting for the organisation. The relations are loosely coupled, and in case of uncertainty, the sense-making helps to solve the uncertainties by involving the scanning, the discovery and the retrieval of information that enables the actors to attribute meaning (Weick et al., 2005). In case of ambiguity, it is necessary to create a social construction and invention of coherent stories that can make various interpretations meaningful (Weick and Sutcliffe, 2001). This perspective differs from the first one for the gnosiological reflections: reality is known through the interactions of the individuals with the external environment and learning is not a passive reception of neutral facts, but a constructive process. During the learning process, the meanings are constantly built in an active way and, consequently, also the real world is the result of a construction, outcome of subjective interpretations socially shared and agreed upon. Knowledge and concepts are built through mental operations in a context of intersubjective cooperation. The managerial practices deriving are not communicated and implemented within a project, but socially constructed, built in the constant effort to give meanings to the context in which they are belonging to. Therefore, the ontological belief is that the events, the models, the rules are not discovered but they are invented: reality is not an objective and autonomous entity that can be discovered through epistemological processes but it is invented through the perceptions and language.

The fourth perspective, *design as a proposal of new meanings* is built on the hermeneutic that is focusing on the role of language and on the interpretation of history. The designers are proposing visions and ideas based on the interpretation of the sociological history and proposing something that can satisfy the unmet needs of customers. This is achieved through a design discourse, using metaphors and paying attention to the semiotics. The value and the essences are contained in the meanings of the objects, captured in the discourse. The discourse is defined on the Foucauldian version

> *a set of relations of heterogeneous materiality, that recursively produces objects, subjects, knowledge, powers, distributions of power. Discourse is production. At the same time it sets limits to what is possible or knowable*(Law, 2004, pg. 159)

The fifth perspective, *management of design as a translation process* was widely explored in chapter 3.

The following table summarises and confronts the five perspectives in terms of design definition, design process, role of the designers, role of managers, value creation, role of the technologies of managing.

	Design as rational decision making process	**Industrial Design**	**Managing As Designing**	**Design As Proposals Of New Meaning**	**Design as translation process**
Design definition	Design is the science for decision making process, a process of problem solving	Design comes from the Latin *designare* and it means both to draw and to plan.	Managing as designing means the monitoring, containing, and reversing of compounded abstractions	Based on this original meaning, one could say: design is making sense of things	Design is the outcome of the process of constructing things by translating interests and goals, enrolling and mobilising actors.
Design Process	Rational decision making by selecting an alternative	Stage-Gate model	Design thinking	Creating a meaningful radical product	Enrolment, mobilising translating, the design process is directed to the creation of the reality (the design)
Role of Designers	Planning courses of actions or artefacts	Stimulating creativity, problem solving, observation, interpretation, aesthetic judgment	Inspirational figures for managers	Understanding the unmet needs of society	The designer is one among the many actors that are working to construct the design; he is a macro-actor
Role of Management	Creating and developing the decision making process	Choosing the designer and the organisational structure	Idea generator who gives form to the new possibilities	Understanding socio-cultural trends, deciding the selection of the designers	The spokesperson works for associating and disassociating features; works for enrolling actors and participates at the translation process
Value Creation	Process of reduction to declarative logic, optimisation process	Higher price, lower production cost, better company image, emotional, symbolic and relational value	Valuable and sustainable workflow, attention to competitors and changing situations	value is in the meaning	Value is built in the relationship and it is the result of the process of associating and disassociating features
Technologies of managing	Allow to recognise what is inside and what is outside the systems	Used for market observation, segmentation; monitoring production and quality	Different organisational structures	Managing creativity and understanding unmet needs	black boxes and leaky black boxes; the managers act upon them

Table 6.1. Comparison of the perspectives including the perspective based on the ANT.

This table is mobilised in the next section to explain how the study in ANT can contribute to the previous perspectives

6.1 Management of design as a translation process: contributions from the analysis

This section aims at contributing to discuss the theorisation of the results of the analysis, and to mobilise them to contribute to the previous perspectives. Therefore, in this section, the ANT perspective represents the theorisations based on the analysis conducted in the previous chapter.

6.1.1 Design Definition

Based on the study conducted in the previous chapter, design in ANT perspective is the result of a translation process, one of the possible final and stable - but fragile - solutions, an outcome of alliances and relations between human and non-human actors. The management of design becomes in this perspective a matter of not hiring the best or most modern and futuristic designers (second and fourth perspective), but the ability to assemble and construct a more stable network, enrolling heterogeneous actors, including instruments, prototypes, machines and the materials (Latour, 1987), managing the struggles and anti-programs that might emerge during the design processes. Design is performative, because the products are defined by their performances (Latour, 1987). There is no way to know the essence, but each performance presupposes a competence, and the design is built in the relations, constantly processed and reproduced,

> *which retrospectively explains why the hero withstood all the ordeals. The hero is no longer a score list of actions; he, she or it is an essence slowly unveiled through each of his, her or its manifestation* (Latour, 1987, pg. 89)

In order to be displaced in space and time, a design is an immutable mobile, presentable, readable and combinable with one another, which makes a design unproblematic, mobiles, with the ability to constantly mobilised to be real (Latour, 1990). The design is not *just* a design, but it is the result of a network construction, which has been problematised, mobilised, socialised, presented, made coherent, and assembled. As the reality exists in the relations to the construction of design: design is constructed and socialised,

made coherent inside different networks after having been developed in an equipped studio or prototyping space, forged as history of its construction and its transformation. Design is constantly in search of allies while the manufacturer are the actors acting in order to capture the allies' attention, displacing goals and enrolling other actors in the network, making constant reinterpretations explanation after explanation, and reinterpretation of the features of the design, through the translations. The translation process involves defining the roles, distribution, as well as definition of a setting, and strategies through which the spokesperson becomes indispensable to others. The displacement imposed upon others as they are forced to follow the itinerary that has been imposed.

The first perspective, design as a rational decision making, defines design as the science for decision-making, and problem solving. The ANT perspective helps to understand that decisions are not ready-made, but they are constantly translated, and managers are taking decision that constantly emerging from the network construction. The decisions are emergent and in the making, as already observed by Christiansen and Varnes (2007), Latour (1987), Woolgar et al. (2009), and these are based on the process of translations, where each translation can be mobilised as a discrete unit of analysis for sending signals about which translations are important on which one the managers as spokespersons can act upon.

In the second perspective, new product development process using industrial design, design means both to draw and to plan. ANT perspective helps to understand the drawing and the planning as non-human actors, and these are mobilised in the network to convey information, they can be used to describe attributes and features, since they are immediately readable. The translation process, being the process of connection links among otherwise unconnected things, can be used to define the graphic representation of the translation, which is an inscription, which is an explanation, and a visualisation. The definition of inscription is provided in the next sentence

> *The essential characteristics of inscriptions cannot be defined in terms of visualization, print, and writing. In other words, it is not perception which is at stake in this problem of visualization and cognition. New inscriptions, and new ways of perceiving them, are the results of something deeper. If you wish to go out of your way and come back heavily equipped so as to force others to go out of their ways, the main problem to solve is that of*

> *mobilization. You have to go and to come back with the "things" if your moves are not to be wasted. But the "things" have to be able to withstand the return trip without withering away. Further requirements: the "things" you gathered and displaced have to be presentable all at once to those you want to convince and who did not go there. In sum, you have to invent objects which have the properties of being mobile but also immutable, presentable, readable and combinable with one another* (Latour, 1990, pg.6)

Therefore, the plans and the draws are non-human actors part of the network which is represented by the macro-actor: the designer.

In the third perspective, managing as designing, design is the monitoring, containing, and reversing of compounded abstractions. Based on the analysis, it can be added that the design is also the translation process. Because the translations make the drifts and the links visible, the managers can mobilise them and work on them to make decisions.

In the fourth prospect, design is considered as a proposal of new meanings. The ANT view helps understanding how the relationships between actors actually happen, how the network emerges, how a spokesperson works for the design and promote the work of the mediator in displacing information, becoming part of the translation process. Therefore, ANT can add to the design definition (based on this original meaning, one could say: design is making sense of things; see paragraph 2.6 for the review of the definition) that the etymology of design goes back to the Latin, and means making something, distinguishing by an inscription, translating and displacing the meaning, creating links/ translating to other actors. Based on the original meaning, one can say that design is actually making sense of things through a translation process.

6.1.2 Design Process

Based on the study conducted, it is possible to affirm that, in order to make a product successful, it is not enough to have some characteristics that make the product appealing (as it is evident from the second perspective on design management), but it also has to go through a translation process that develops it, keeps it alive, accepted, adopted and finally adapted by the public. Longer the duration of this process is, longer the translation process is, higher the number of actors involved in the process, more the likelihood

that the sales will be higher and the other actors, not yet enrolled, will be supporting it. The design process is constituted by all the actions that are taken, the decisions that are made, not only during the development phase, but throughout the whole life cycle. The design process is a continuum of actions made to solve struggles and keep the actors enrolled in the network, keep them interested, or, when the sales are decreasing, to work for the maintenance of it, so that not all the actors are leaving making it collapsing, as it happened in the third episode of the Egg.
Based on the observations conducted in the analysis, it is possible to affirm that the design process is a translation process. The networks that were formed were constituted by heterogeneous entities that were associating. The translation process ensured to define their identity, their role, the relationships that unite them. This process forged the history in which the actors participated and contributed to design the object. The analysis shows that the networks that were created (if they are compared moving from one episode to the other or comparing the same episode in the three chairs) did not draw from the previous established stocks, they constantly changed or got negotiated through the translation process. The design process, thus, is not extracted from pre-existing elements, but it is a continuous process of changing, determining the movement of the life cycle. In any episodes, the spokespersons cannot be silent, if they lost their voice and their persuasive power, the network was modified, the struggles emerged, the translation process was interrupted and the sales were decreasing.

The translation process is mainly guided and directed by the managers of the companies (Alto, Eames, Saarinen, Hansen, Lassen, Holm), defining the identities, the roles, the course of actions to follow, the links to create, the project to carry out. The translation process leaded to enrol more human and non-human actors. Together with the spokespersons, they were working to mobilise, enrol, and interess by translating the goals other actors, and inciting to do the same and to stabilise the network making it less fragile. It is possible to interpret the design process as a translation process, during which a mishmash of decisions that cannot wait are taken in an environment of complex changing markets and customer tastes (as already observed in Akrich et al. (2002a) for innovation studies), in which actions cannot be planned or predicted in any mechanical way. The decisions and the alternatives among which managers have to choose are difficult to capture in a historical setting. Therefore, it was decided to look for the allies part of the network, the associated and disassociated features, and the translations were considered to narrate the decisions taken and how others get to support, interact, and devote their energy and resources toward something, how actors

got enrolled, and which role they occupied, that was not pre-given, but co-constructed. Design practice is messy, muddled, contingent, and displaced. Designers are macro-actors represent a network of actors participating at the design process, working using multiple registers, and different version of facts. The design product is the outcome, the manufacturer and the designer (as macro-actor) control the inscribed and prescribed features. The design process is about building relationships between heterogeneous entities, attributing features and creating values that are existing in the relationships, assembling durable design, agreeing on the awareness of the process, affirming that there is no inner essence in the design, but it is built in the ratlines, constantly negotiating what design is and its features.

The first and the second perspectives define the design process as a decision making process, while the third defines it as a problem solving process based on design thinking. The process is described as creative, imaginative, intuitive, opportunistic, innovative, unpredictable, leading to solve problems, and develop novel products.

In the first perspective, design as rational decision making, the design process, because of the pragmatic philosophy on which it is based, is a rational decision making done by splitting it into steps and listing the alternatives and which can be the consequences, intended as a process or error reduction. The ANT perspective based on the analysis contributes to understand it as an emerging practice, in which the decisions are not static or mechanical, but are constantly in the making. Thus, the managers seem to act in a constant translation process which they activate by making decisions directed to solve problems.

In the second perspective, new product development process using industrial design, because of the positivistic belief, the design process is accomplished through the stage-gate system, and decisions are made on the information received at the stages and gates. The ANT perspective contributes to this perspective by adding the understanding of the process as an outcome of the decisions happening in the translation process, as happening in the meetings and displaced into templates (Christiansen and Varnes, 2007), conveying information and used as technologies of managing. The templates are actors in the networks; these are mediations, not simple checklists (Christiansen and Varnes, 2007). If the design process is a translation process, then the paths and the meetings for checking the progression of the projects are opportunities for constructing relations, mobilising actors that

were reluctant to adhere to the program of action and discuss the associated as well as the disassociated features.

In the third, managing as designing, the decision-making and the problem-solving are made collaboratively in the company, and design is one way of enacting the reality (Weick, 1993), because design is perceived as a way of knowing by doing things in a trusted environment, in which managers are entitled to act. The ANT perspective contributes also to the notion of thrownness (Weick, 2004b). According to this principle, the managers are thrown in the world and they have to act consequently; however, the philosophical base of ANT sustains that the world is co-created, and the managers are not acting on a prior existing world, eliminating the feeling of acceptance of the situation, but they are stimulated to create and frame the situation. In a thrownness belief, the managers can argue that they can not change the situation that was a priori existing, while in ANT perspective they are acting, taking decisions, building the reality. From the analysis, it emerges that the process is made in a co-constructed reality, it is a matter of coupling and acting in the relationships. The managers, therefore, are providing inputs to the decision-making. Although they are not in total control of them, they can stimulate their actions.

The fourth perspective, design as a proposal of new meanings, defines the design process as an operation for creating meaningful radical products, working on the meaning of the product, which is metonymically invoked by the actual sense and unfolds it into actions to anticipate the actual sense (see figure 2.15: Value creation through semantics based on Krippendorff (2006)). It is based on the hermeneutic philosophy; therefore, it is a circle which allows the interpretation and the understanding of social events through the analysis of their meanings for the participations in the events, and each individual part of the process is understood by referencing to the whole (Gadamer, 2008). The ANT perspective contributes by suggesting that the design process of creating new meanings is not the outcome of an hermeneutical circle or self-references, but it happens within a translation process during which there is not a separated external reality from the internal one, but the process happens within the network, and through the relations. It is possible to create the meaning by translating the goals and the programme of actions (meanings) of the designers with actions.

6.1.3 The role of designers

The designers are one of the actors involved in the creation process, one among a multitude taking or agreeing on the final decision about the design and the development during the life cycle of an object. The individual qualities of insight, intuition, vision, creativity are reinterpreted and assembled in the language of the design, not being anymore the properties of an individual, but a collective virtues, where governing and managing have a fundamental role, as already observed also in innovation studies Akrich et al. (2002b). Design is constantly in search for allies while the designer is the actor representing the network of actors working on the design, actively mediating goals to enrol other actors in the network, making constant reinterpretations explanation after explanation of the features of design. The customers neither tame totally the design nor they fully understand, especially if the construction process is difficult, the use of unique material, and the peculiarity of the design. The designer is the actor in charge of explaining these difficulties (for example, Kasper Salto presenting the Ice around the world, or Arne Jacobsen presenting it to the architect association, at RIBA), and these forms of explanations are forms of mediation. The designers are macro-actors belonging in the network and the representativity is not brought into question in the process, so that the designers can act to protect the design and the translation process. It is not possible to determine a macro-actor only from his/her dimensions as all the actors have the same size, and they are isomorphic, meaning that a priori there is no possibility to decide the sizes as it derives from a long struggle. The analysis of the three designs highlighted how the design process is a complex process, constituted of micro-decisions, not only during the product development phase, but through the whole life cycle, during which many actors intervene, including the designers. Compared to the other allies, the designers are the fulcrum of juxtaposition and simplification; the notion of juxtaposition and simplification was explained in Callon et al. (1986). Simplification because the designers represent the network of actors that are working for designing the product, they are the entity that defines the context of the design process and the associations of the actors working together for the goal. The juxtaposition defines the conditions of operation for the network (Callon et al., 1986), the actors in the network agree on the translations and on the structure of the relationships, so there is coherence, consistency and structure in the network, represented by the designer. For these reasons, a designer is one among the actors designing, he/she is the is a macro-actor representing the network of actors working in the design process, and he/she has collective virtues.

In the previous perspectives, the designers are described as individual persons, mere executors of orders, inspiring persons, as the only one able to make proposals. Therefore, ANT can contribute by affirming that the designer is a macro-actor, one among a multitude of actors designing.

Specifically, for the first perspective, design as rational decision making process, ANT can help to understand that the designer is representing different actors in the organisations (both humans and non humans, as described in Simon, 1969), and representing for them the designing of the translation of different paths of decisions into an inscription that will be mobilised by the managers to make decisions.

To the second perspective, industrial design, ANT can add that the designers are not only persons able to stimulate creativity, solving problems, improve the aesthetic of the product, but they are also representing all the actors involved in the product development process. Their strength is not only individual characteristics and capabilities, but the presence of the network supporting those characteristics and making them possible.

Furthermore, both the first and the second perspective could benefit from this insight involving the designers during the all product life cycle, not only during the development process when they are described as consultants executors of orders.

In the third perspective, managing as designing, the designers are described as inspiring persons for the managers, but they do not have an active role in the theory; the managers learn from them. How they interact with managers is not explained. ANT can contribute by suggesting to interpret the reality as co-created, designers are the representatives of a network of actors concurring to the design process, and all of them have an active role in the teaching process. The managers are seen as attentive to this network, being receptive not only to the actor representing it, but also to the other actors when they are emerging. If the social constructivism philosophy is elaborated towards the co-constructivism, managers not only learn, but also co-construct knowledge, building a programme of action that is more appropriate for managers, and the designers are part of this knowledge construction process.

In the fourth perspective, design as a proposal of new meanings, the designers are considered as the only persons able to understand the unmet

needs and propose a radical product or service which has a new meaning. The personal qualities of the designers analysed by the authors are reconfigured and reformulating it in the language of the actor-network perspective, moving from a diffusion and hermeneutic perspective to a co-constructivistic one. The designer is an external consultant able to deliver a service to the company that hired him (Verganti, 2009), but often with the fulfilment of the contract, his role seems to stop. The ANT perspective can help to redefine the role of a designer as a collective actor, as a macro-actor with an active role in the translation process, by favouring different types of interactions, engaging framing devices for a rapid adaptation and later maintenance. The designer, thus, not only engages himself actively as framing actor (Verganti, 2009), but also as an actor that is able to problematise, looking for actors to interest, and to enrol in the network of his/ her products. Owing different sensibility compared to other actors in the network, the designer, when he/she is enrolled, seems to help in creating a stable network of human and non-human actors, who later become allies across social, organisational, and technical domains, overcoming struggles that occur as the process unfolds, successfully getting others to support, interact, and devote their energy and resources toward the acceptance of the design. His role, therefore, is not only important in the development process, but also during the whole life cycle of the design. The design is constantly in search for allies, and the designer is the actor acting in order to capture allies' attention, displacing goals and information, explaining the design to enrol other actors in the network, re-interpreting the meaning of the design. There is not an essence of design, not an embedded meaning or appreciation of it. Design is the result of the work of the designer communicating the result of the network construction, and the meaning is an effect, not the cause of the construction of the network of the product. Furthermore, the fourth perspective can benefit from the understanding that the designer as macro-actor plays an active role during the development and the life cycle of a design, not only during the product development process, when he enters as consultant and his job is terminated once the product is launched in the market.

6.1.4 The role of managers

In the analysis, the managers were spokespersons. They translated the needs, the expectations, and the demands of different actors expressing their desires, their interests and their mechanisms of operations, as already stated in the research of Callon et al. (1986). The translation is a endeavour to enrol other entities, displacing goals, identities, challenges and it is also an effort

to speak for and to become indispensable (Callon et al., 1986). The managers are strategists, spokespersons that are imposing actions on the other actors. In order to be successful, they have to translate, find compromises, put together disconnected parts, show flexibility to displace the process and making it simpler, more understandable by the network of actors (Latour and Porter, 1996). The translation are not be intended as the starting point of an action, but as the first result of a preliminary scenarisation (Latour and Porter, 1996, pg. 177). The managers have to constantly act. If they do not act, they do not continue the translation process, and there is the risk of breakdown of the network created around the object because no actors are acting on it, working on the design. The characteristics of spokesperson correspond to technical decisions which contribute to define the social groups concerned, setting some as allies and defined as adversaries or sceptics (Akrich et al., 2002b, pg.205), making sure that they are destabilised in the network. As it can be seen from the analysis, the translation process is supported by the managers. The notion of management, within actor-network perspective, is an action of making profit through the process of constructing, translating, making, shaping human and non-human actors. The spokesperson is someone who speaks and acts for the actors who do not speak (Latour, 1987), and the actors agree in what they would say for themselves is the same of what the spokesperson is claiming (Latour, 1987). The spokesperson can be of two typologies: objective or subjective depending on the trials of strengths. Objective spokesperson's link resists in spite of the efforts of disbelievers, while a subjective spokesperson does not speak in the name of other people, but represents only himself (Latour, 1987), and makes clear that humans and non-humans are fused together, involving both in the network construction. In the analysis, the managers were objective spokespersons, because the were speaking on behalf of others and not only for themselves. If they were subjectives, no traces would have left. The work of the managers in the network became a matter of moving and reconnecting actors, aligning them, studying the translations and creating new enrolment and enforcing existing ones; everything existed because of the relationships. The focus of managers was on creating the relationships between human and non-human actors, acting to enrol actors in the network and to stabilise it, and to make it less fragile when struggles appeared. By speaking on behalf of and for the design, they were trying to create a stable network of human and non-human actors (Latour, 2005), who became allies across social, organisational, and technical domains. Translations are made by each actor who sees a margin of negotiation to transform the meaning in order to fit and adapt it to local circumstances, stated by the spokesperson (Latour, 1987). The

reality exists when actors are acting or acted upon. Networks are performative and by nature temporary, constantly created and recreated (Harman, 2009a, Latour, 1999, 2005, Latour et al., 2011), and the spokesperson tries to give stability for the network.
The managers can work to mobilise actors, but consequences of the actions can be unintended. For example, the developments of the Egg and the Serie7, were long processes during which the managers mobilised actors that located in different networks; Søren Hansen showed to Arne Jacobsen the Eames and Saarinen chairs. Søren Hansen wanted to decrease the costs of the manufacturing by creating a new chair, that was able to reduce the manufacturing costs and overcame the limitations of the bent wood. He mobilised the Eames chairs, and their material, and together with Fritz Hansen, made possible the manufacture of the Ant, designed by a macro-actors, composed by Arne Jacobsen, his studio, Søren and Fritz Hansen, the materials, the chairs from USA, the black boxes of organic design. However, the customers complained about the Ant and wanted a design with armrests and four legs. Instead of changing the Ant, Søren Hansen and Arne Jacobsen mobilised the DAN and it translated into the Serie7.

In the first perspective, management has a role of creating a favourable decision-making process environment, but they have a limited cognitive capacity for searching for the solution to a problem. ANT suggests that managers focus on decisions, but they need to consider the many other actors involved in the process of decision making. It is not a lonely activity but the heterogeneous network contributes to co-create de decision, and managers act upon them. The ANT perspective reveals that the decisions are confused, made by a large number of different and conflicting groups, and it is unable to say if they are crucial or not a priori (Akrich et al., 2002a); the environment is diverse complex and entangled with different actors.

> *The actors which intercede to make decisions are so numerous and so entangled with each other that at the end of the process, nobody no longer knows to whom the paternity of the results should be attributed to* (Akrich et al., 2002a, pg. 193)

In the second perspective, the role of managers is a role of decision makers. They are the persons who choose the designers within time and budget constraints, they are facilitators choosing an appropriate form of design of the organisation, problem solvers liaisons between different function, in charge of the communication process, and they are cultivating the relationship with the designers. The ANT perspective helps to understand the industrial design

school by adding that in the relationships there is the essence, they are tangled up what appears logical and consequentially is illogical and irrational (Akrich et al., 2002a). The decisions are a mishmash of choices made by a collective group of actors, and the spokespersons (the managers) speak on their behalf. Therefore, the process of decision making has to be understood in a network perspective (Christiansen and Varnes, 2007).

> *It is one thing to recognise that an innovation progresses by means of decisions, some of which are occasionally implicit; it is another to maintain, as we have started to do, that these decisions are made in the middle of uncertainties amongst which it is practically impossible for a sure case to be guaranteed* (Akrich et al., 2002a, pg.194)

In the third perspective, the managers are idea generators who provide forms to new possibilities with a vocabulary of design. The managers are working for implementing creative decisions, creating innovative and long lasting organisational betterments, and shaping the spaces of the organisation. The ANT perspective can help to understand that managers are spokesperson speaking on behalf of the company and setting the goals, they are constantly acting and they cannot stop from acting (as in the extreme case of the throwness principle). They have to construct arguments and goals, mobilise and enrol actors and make accountable relations among the heterogeneous network.

In the fourth perspective, the managers are responsible for finding and nursing the most important actor in the development of a radical innovation, the designer. The managers have to put him in contact with the rest of the company, and create a stable environment, while the decisions are made in an unpredictable environment. As pointed out by Akrich et al. (2002b), this role is too much reductive, it is not explaining enough all the hard work of managers in building up the network. Managers do not just managing, but they make strategic and technological choices, they mangers take care of the series of actors and choices. The fate of the design rests entirely on the actions of the spokesperson, which interacts, negotiates, gives shape, and transforms the project (Akrich et al., 2002b) through a translation process.

6.1.5 Value Creation

The following table depicts the value creation as intended in the different perspectives

Value	**Design for decision making process**	**Industrial design**	**Managing as designing**	**Design as a proposal of new meanings**	**Management of design as translation process**
Generated in	Its properties and fitness to the task	Price and desire for products	Social structures	Social and cultural context	Relations
Understood as	Durable	Objectively determinable	Determinable within the organisation structure	Subjective, arbitrary, depending on the culture	Emergent and fragile
Design product	Utility	Cost- opportunity object that is measurable economically	A mean to an higher end	A sign	An actor
Implication for managers	Need to meet specific ways of doing things	Need to make the products competitive, distinguishable and more desirable	Need to cope with different belief systems	Need for understanding the social and cultural context	Need to define the associated and disassociated features and communicate through a translation process

Table 6.2. Value creation in different perspectives, inspired by Boztepe (2003).

The value creation process in the analysis was seen as a value constructions that occurs by translating the features, which are continuously negotiated and defined in networks incorporating different actors. In ANT, there is a symmetry between humans and non humans and the reality is constructed in the network. Therefore, it is positioned in the anti-essentialism branch, in which it is believed that the distribution of attributes are recognised as contingent, negotiated upshot of local and historical processes (Neyland and Senekova, 2012, Woolgar, 2004) After conducting this study, it is evident that the characteristics are neither inherent in the object affirmed nor based on the organisation of the structure in which the managers are thrown into it, or in the object itself. In the previous literature it seems that, once the product has been developed, the interpreters explain it to the customers and the customers will be ready to accept it in a passive way. In the previous perspectives, it was interpretable as it happed through diffusion, a theory

that has been demonstrated to not be longer valid in innovation processes (Akrich et al., 2002b,b).
In the analysis, values are treated as outcomes of the features associated or disassociated. The value creation process is a process of associating and disassociating features in the relations and transforms every time the relations change. The values are fragile, they are mediated, value is intended as created and constructed in the release starting from the feature associated or disassociated features. The reality is not there a priori, but it is created. Managers and the spokespersons made a bigger effort to sustain the value creation process, actively acting. The value is generated the distribution is relative and open for interpretations, but needs to be framed and mediated for the interpretation that is more appropriate (according to the device). The value is widely distributed in the network and they are in the constant danger to fall apart and not being durable. Durability is a reflection of the cost of unpacking and disrupting the relations between the actors (Woolgar, 2004). Values are also enacted, and the enactment is about understanding the world being always in a continuous process of reproduction (Law, 2004). The features that form the value of the product are not embedded in the products (as it is for the previous perspectives), but built around it through narratives, stories and descriptions. The features are not fixed, but they change during in the process, and some timed what was disassociated, then became associated and vice-versa. Akrich et al. (2002b) reflect on the fact that customers are difficult to follow; the customer is a key protagonist, but a direct contact is not enough to set the configuration. Therefore the company needs an attentive spokesperson to careful frame.

> *The evaluation of the disadvantages and advantages of an innovation is entirely in the hands of the users: it depends on their expectations, their interests, on the problems which they raise* (Akrich et al., 2002b, pg. 202).

Value creation is a never-ending process, in that the products are considered the result of a process in which value constructions are constantly negotiated in actor networks. The processes of spokesperson and the mediators help the continuous flow of information among the firm, the consumer, and other actors, framing the associated and disassociated features. The Serie7 and the Egg are a success because various actors have concurred to make a strong network, and even when there were low sales, the network was strong enough to not let the products disappearing. The value of a product is not certain, indicating that it cannot be predicted and planned. It is complex and ambiguous and need to be framed:

> *Failure, like success, rests on the mutual adaptation of a well defined product and a clearly identified public* (Akrich et al., 2002b, pg. 203).

In the first perspective, design as rational decision making, value is generated in its properties and fitness to the task, in the sense that value is created whenever the manager has a system to use to make decisions, based on standards that determine actions, preferences and beliefs: Simon defines design as the process by which the managers devise courses of action aimed at changing existing situations into preferred ones (Simon, 1976). Therefore, the management creates a system that facilitates the permanence of routines that allow this specific way of doing things, thus creating the organisation value.

In the second perspective, industrial design, the value is centred on the customers' decisions to buy the products and this creates value for the company. The value is considered as value for money, a monetary sacrifice that the customers have to do in order to buy the product. The company value has to offer a design product whose price is aligned with the willingness to pay of the customers, to the desire they have for buying it. This is a cost-opportunity that can be measured economically. Some researchers have argued that time is also a variable that enters into the price consideration. For example, in Marmorstein et al. (1992) argued that

> *of primary interest was the finding that consumers appear to incorporate the qualitative aspects of shopping into their subjective value of time. Two types of evidence support this conclusion. First, the enjoyment variable has an effect size comparable to that of the wage rate. Second, addition of this predictor significantly increases the amount of variance explained in consumers' subjective value of time. These results help to explain the weak relationship that has been observed between consumers' search and their wage rates (or incomes) in previous empirical research* (Marmorstein et al., 1992, pg. 59).

The managers have to ensure that the customers are satisfied with the time spent for shopping the product, whether shopping is enjoyable experience (Pine and Gilmore, 1999). The authors claimed that customers are willing to buy commodities, goods, pay for services and experiences. Companies offer experiences whenever they engage customers, connect with them in a personal and memorable was (Pine and Gilmore, 1999, pg. 3), and they can

afford to increase the price, because the customers are willing to pay for it (Pine and Gilmore, 1999). Products are desirable, enjoyable experiences able to satisfy the needs of the customers. The relationship between desire and value has been widely described by Simmel and Frisby (2004). The following extract expresses the managerial implications, and the fact that managers, in order to make the products competitive and they have to ensure to offer a product that is not only enjoyable, but also desirable:

> *As Kant has said: the possibility goes the experience is the possibility of the objects of experience- because to have experiences means that our consciousness creates objects from sense impressions. In the same way, the possibility of desire is the possibility of the objects of desire. The object thus formed, which is characterised by its separation from the subject, who at the same time establishes it and seeks to overcome it by his desire, is for us a value. The moment of enjoyment itself, when the opposition between subject and object is effaced, consumes the value. Value is only reinstated as contrast, as an object separated from the subject* (Simmel and Frisby, 2004, pg. 66).

Early studies on value as meaning were conducted by Csikszentmihalyi and Halton (1981), Bourdieu (1984) and Appadurai (1986). Csikszentmihalyi and Halton (1981) investigated the relation between investment and utility. They demonstrated that people invest in objects with meanings, but the meaning is not comparable to the utility: the meaning that the users explain are most of the time different from the meanings that the producer intended to give. There is a process of self awareness, an act of influence that opens the process of self and enable one to infer what the object of self awareness is (Csikszentmihalyi and Halton, 1981). In the study, the researcher asked to select some objects and to describe them, and they noticed that the users were building their identity throughout the description. They concluded that the use of things for utilitarian purposes operates within the symbolic provenience of culture (Csikszentmihalyi and Halton, 1981). Bourdieu (1984) depicts goods as sources of capital accumulation, economic, cultural (knowledge and education), social (relations) and symbolic (prestige). Miller (2008) conducted an ethnographic study with his team in a neighbourhood in London. They entered in the houses and asked people to describe the objects they are used to related with and the researchers tried to understand the meaning of the objects. It emerged that consumption is a process through by which people materialise or objectify values and meanings, resolve conflicts and paradox

in everyday life, and materialise identities.

In the third perspective, value is generated in the social structure, the organisation has to work properly in order to create value for the society. Therefore it becomes a mean to an higher end. The management has to work in order to make the people in the organisation coping with different beliefs systems.

In the fourth perspective, value is generated in the social and cultural context (Verganti, 2009), it is subjective and culturally determined. The social and the cultural contexts are not stable but constantly changing and it depends on the meaning of the object. The value is associated with the meaning of the object, therefore it is subjective, arbitrary, depending on the culture and embedded in the relationships (Krippendorff, 2006).

Therefore, ANT can contribute to all the previous perspectives to understand that the essence of the design is not embedded in it, but is constructed in the relationships. The spokesperson works to associate or disassociate the features, and it is a constant negotiation among different actors, who have to accept them and agreeing upon. They are not a priori existing, but co-created.

6.2 The role of technologies of managing

The technologies of managing that have received most attention in the literature are the accounting systems and the accounting reports, such as accounting reports, budgets, business plans and market reports, and they have been defined as

> *Programs for rethinking the factory do not operate on their own. Programs require technologies if they are to operable (Gordon (1991); Miller and Rose (1990)). By technologies we mean devices for intervening, instruments for acting upon people, objects, and processes so as to shape or influence them. It includes various forms of calculating, writing recording, examining, assessing and visualising that have the capacity to act upon and transform the person, object or process in question* (Miller and O'Leary, 2008, pg. 93).

Technologies of managing helps to develop an understanding of the relationships between organisational structure and decision-making. In the previous perspectives, the technologies of managing are considered as tools to control and to facilitate the idea generation. Czarniawska and Mouritsen (2009), Hansen and Mouritsen (1999), Mouritsen et al. (2001a), Mouritsen et al. (2001b) have studied the accounting system as a technology of managing. This dissertation helps to reinterpret the notion of technologies of managing. In the ANT perspective, the technology of managing is considered as mediator conveying information and managers can use this information to make decisions. For example, accounting systems gather information about profits, assets and liabilities which occur at the end of an organising process, reducing or amplifying the traces left by actors, as management tends to avoid the contact with the objects and the technology produced in the company, concentrating the attention to the accounting reports and management technologies (Czarniawska and Mouritsen, 2009). Therefore, managers mobilise them and act upon them. But, as the essence in ANT is widely distributed, managers need to have some actors, some mediators that are difficult and costly to unpack and also holding the relations among the components (Woolgar, 2004), and easily be acted upon. In the analysis, these entities were identified in the black boxes (black and leaky). Thus, the technologies of managing in these thesis are re-interpreted as black boxes.
When the black boxes are unproblematic, they are completely closed, completely black boxed, and easy to manage.
However, some are leaky, not totally closed, easily opened at the occurrence. In the analysis, it was delineated that managers, while mobilising these leaky black boxes, could change the features associated to the chairs and they could enrol new actors in the network.
The identified black boxes are:

- Classical design
- Danish design
- Material: plastic and aluminium
- Organic design
- Plywood
- Rubber feet
- Screws

- Financial reports
- Scandinavian design
- Styropor

The identified leaky black boxes are:

- Arne Jacobsen (values)
- Brief
- Colours
- Financial reports
- New buildings
- Styropor
- Wood
- Veneer

The following table represents the technologies of managing black boxes and leaky black boxes in the different episodes. The material, if accepted and used in an unproblematic way, is considered a black box, but at the moment of the adoption and adoption in the company and during improvements, the material becomes a leaky black box. In the table, no distinction between leaky black boxes and black boxes is made. The rubber feet and the screws and all the other materials used for building the chairs are assembled in the material components.

	Organic design	Scan-dinavian design	Danish design	Material com-ponents	Plywood	ISO	Plastic	Leather	New build-ings	Financial reports	Colours	Out-sideWood	Arne Jac-obsen (val-ues)	Styropor	Brief
Serie7 1.1ep.	x														
Serie7 1.2ep.	x														
Serie7 1.3ep.	x														
Serie7 2 ep.	x	x	x	x	x				x		x				
Serie7 3 ep.		x	x	x				x			x	x			
Serie7 4 ep.		x	x	x	x	x				x	x	x	x		
Egg 1.1ep.	x														
Egg 1.2ep.	x														
Egg 2ep.			x	x					x		x		x	x	
Egg 3ep.			x	x						x			x		
Egg 4ep.	x	x	x	x							x		x	x	
Egg 5ep.	x	x	x	x		x					x		x	x	
Ice 1ep.															x
Ice 2ep.				x			x			x					
Ice 3ep.				x		x	x			x					

Table 6.3. Black boxes in the different episodes of the three chairs in order of appearance in the episodes.

From the above table, some considerations can be made.
The organic design was a black box when the new chairs were introduced in the market. When the actor was mobilised for the description of the chairs, in the documents its meaning was not explained, it was taken for granted.
Scandinavian design and Danish design are black boxes in the last episodes, when the Danish design has been recognised as iconic, classical, good qualities, including some architects that participated at the design in the 1950s-1960s. In those episodes, when the black box was mobilised, it did not need more explanations because the actors in the network knew what it was referring to. Also the values of Arne Jacobsen as been black boxed and once they are opened up. they are referring to quality, Danish danish, classical design, iconic design.
The material components of the chairs (like the screws, the rubber feet, the legs) were black boxes after the introduction in the market, made unproblematic components of the design. The outside layers and the leather were black boxed in the last episodes, when it became unquestioned the value of those material.
The plywood was black boxed, but some times it was leaky, because the company changed the process or made an incremental innovation to make it more resistant.
The plastic of the Ice chair and the styropor of the Egg were black boxed after the introduction in the market, when the actors in the network accepted it as material for the chairs and it was not necessary to modify during the process.
The ISO certifications are an actor that entered in the last episodes for all the chairs. It is a black box because the components are decided by the law and they could not be changed. Therefore, they are made unproblematic by the managers in Fritz Hansen. The certifications, decisions were considered technologies to mobilise for taking decision, but the managers did not know of the technical details for the ISO; if needed, they consulted the technical staff and mobilised also the balance scorecard developed by the company (the first design company in Denmark to have it) than certification labels, rules of productions that can be interpreted and challenged.

The building were black boxed, because the company took for granted, during the second episode of the Serie7 and of the Egg, that the chairs would have been displaced into new buildings designed by the macro-actor Jacobsen The colours are referring to the colours by Arne Jacobsen. They were designed in the second episodes for both the Serie7 and the Egg, and since then they were referred as “the classical colours of Arne Jacobsen”, and they

are made unproblematic. The Ice chair had different colours, but it is not black boxed which is the "classical colour of Kasper Salto".
Concerning the financial reports, that are considered in the literature one of the technologies of managing, they were black boxed and mobilised during the crisis (when the company was about to go in bankrupt) and for the Serie7, to mobilise the feature that is the most sold chair in the world, and most of the profits of the company have been generated by this chair.
Since Fritz Hansen was bought by the Scandinavia Tobacco in 1973, financial reports became more formal and explicated in the financial statement, because Fritz Hansen management has to report to the holding, the reports, the minutes from the meetings and the financial statements have been more accurate and more frequent, with a higher level of detail. This can be interpreted as that the actors in the board of directors needed to make a longer translation and a different argument compared to the one proposed by the challenge where it was still a facility based on actions. The board in the late '60s and '70s made some decisions (e.g.: investing in plastic chairs in the era of the oil crisis) which lead the company almost into bankruptcy; therefore the company needed to be more observable.[1] They reveal the mechanisms through which the government is articulated and made operable. It is a social practice constituted by social relations, because it is influenced by the multiplicity of agents, institutions and processes (Miller and Rose, 1990). According to Cooper (1992), managers use the technology to have control and take decisions, and to represent related information. The way information is produced and managed is through displacement, that is the act of moving things, changing relations between different actors and then acting and intervening on the part of the world (Cooper, 1992). An artificial situation is thus created, where the real world is transformed into an artificial one to be made more manageable, clear, visible and transparent. The goal of the managers using these black boxes as technology of managing is to make the organisation seeable, controllable, and is intended to be controlled remotely, to reduces what is distant and resistant to what is near, clear and controllable (Cooper, 1992). The financial reports gather information about profits, assets and liabilities which occur at the end of an organising process, reducing or amplifying the traces left by actors, because management tends to avoid the contact with the objects and the technology produced in the company, rather concentrating the attention to the accounting reports and management technologies (Czarniawska and Mouritsen, 2009). Knowledge about phenomena, objects and technologies is created through inscriptions; inscrip-

[1] information confirmed during the presentation in the company on the 31st of October 2013

tions are transported to a centre of control where managers can act upon them at a distance, fostering the decision-making process, and becoming mediators in the processes of strategising and organising, because of the decrease the degree of complexity for the management. By separating these elements, control is emphasised through simplification (Czarniawska and Mouritsen, 2009) but simplification thought translations might distort the observations (Hansen and Mouritsen, 1999). Hansen and Mouritsen (1999) argue that the same managerial technology can shift from being a business technology to run continuous operations and a managerial technology to take decision in episodic moments. When managerial technologies are activated, action at a distance is enabled, allowing a perspective on the firm and the issue of interest; when order issues are problematised, managerial technology helps to solve problems and improve performance. In Fritz Hansen, the design manager in the interview was aware of the need to have the financial reports and to mobilise them for making decisions on the products. The spokespersons of the company have made the technologies resistant and malleable; they can use it and they can take decisions over it. Therefore the technologies of managing are the black boxes in the analysis.

Not only the mangers need informations, also the designers, and this is why, the brief is a technology of managing. The design brief is a document developed to specify which are the businesses that needs for the design, and for the designers, focusing on the product description and development, not on the aesthetic. It is considered the outcome of negotiations and successful relationships between multiple actors, including designers, design manager, CEO, computers, tables, contracts, and so on. It becomes a tool for the management of a design processes and products. The brief can be mobilised for different purposes, depending on the actor who is mobilising it. If it is the designer department, it is useful to create a new product. If it is mobilised by the top management, it becomes a managing technology tool, able to abbreviate the distance between the designers and the management. As actors have different perspectives, approaches and knowledge about the world, they use different meanings and relations with the words. Language (intended as words about the world) circulates and needs to be translated. The brief becomes a sort of narrative about the firm's ambition to create value for its customers. It is considered as a tool through which knowledge is translated into figures, texts and illustrations making a composition: a written development and translation of the designers, ideas and knowledge of different source and resources. These collective actions produced knowledge, and needs to survive in networks with its constant reproduction or repetition. It is written in such a way so that it becomes comprehensible

to all the actors in the network: collaborators, CEO, external designers, the development and marketing departments. Drawing and prototypes are other mediators. One cabinet maker working for Fritz Hansen, reported in an interview conducted in the '70s for the *Politiken* that he was frustrated when he received the drawings from Arne Jacobsen, because there were few lines different from the architectural drawing, difficult to interpret and difficult to understand. It was very difficult to translate them into prototype, and Arne Jacobsen was very severe in having the translation fully understood, without losing any information in the process. The brief is a mediator that enrol the designers with the willingness to look for a product with new meanings and imaginaries. In Fritz Hansen, the brief is made by the designer department as the result of the discussion with the CEO of what is needed, what is missing in the collection or what would be interesting to propose as new perspective. It has been made by describing the project in pictures, sounds, words, and trying to frame the project, without picturing it too much. It is a framework, not a description of what to do, because it is desirable to have designers' s interpretations, their values and meanings which allow to co-construct the product.
For the aforementioned reasons, the brief becomes the management technology tool, because the CEO takes decisions based on that. It abbreviates, it makes the structure visible, helps to make decisions and to control the development of the new product, helps to check the progression of the project and the performance of employees. It is a black box that needs to be mobilised to be meaningful, but it also is modified at will, without any change in its internal proportions (Latour, 1986). It can be reproduced, and recombined. It superimposes several images of totally different origins and scales, it is made part of a written text. Latour (1990) described the brief as follows:

> *It also creates a common place for many other inscriptions to come together; margins of tolerance can be inscribed on the drawing, the drawing can be used for economic calculation, or for defining the tasks to be made, or for organising the repairs and the sales. But drawings are of the most importance not only for planning but also for execution since by means of them the measurements and proportions of all the parts can be so sharply and definitely determined from the beginning that when it comes to manufacture it is only necessary to imitate in the materials used for construction exactly what is shown in the drawing* (Latour, 1990, pg. 25).

Therefore, the brief is considered as a mechanism through which knowledge, meanings, values and different language can become practical and realised. It moves around between different actors, departments and communities, being a condensation of ideas and imaginaries that define the boundaries of a back box that can open can make the design of the product even stronger, involving the whole network. The design brief is part of the design management and design strategy, defining the roles and the timing of running the creative processes and to get external designers interested. In Fritz Hansen Company the brief is a translation process, started by the CEO, involves the design manager and the marketing manager in a discussion to check if anything is missing in the collection. The brief is black boxed when pictures, sounds, and words are inscribed in it without dictating the project too much; it attempts to inscribe the aim of the project, and it can be presented to the external designers. The brief is described by the design manager as a compromise, since a part of the brief is based on feedback, wishes, on interviews with some customers, done by the marketing and sales department. The brief may also be based on some interviews with the dealers and the partners, but also always part of the brief is original and defined by the design department, the managing director, as well as the president of the company. The brief is an actor that is enacted throughout the mobilisation of many actors which are translating their needs.

It is evident that the black boxes are the reconstruction of previous interpretations, and are built during the episodes. Stabilisation makes them unproblematic, whereas while encountering some problems, such as some discoveries in the materials, some changes in the features, they become leaky and the managers work for closing them. In the black boxes, a series of technical actions, time, space and type of actors are incorporated. From the analysis, it emerges that the black boxes are becoming leaky when they cannot be mobilised unproblematically, missing the meaning they used to have or losing the force they used to carry. For example, the veneer and the plywood have been black-boxed in some episodes, whereas in other, they are leaky, because there have been some technologies advancements or changes in the production. Arne Jacobsen values are leaky, in the sense that the values associated were used to describe the features of the chairs, and they were changing from episode to episode and from chair to chair. The black boxes are actors that help to overcome technical or design problems, allowing a detour, so that the settled goal can be reached. The leaky black boxes are closed when the managers are able to grow the rationality of the means and ends, making them obscure and unproblematic, without modifying them

during the detours, because each detour is a translation (Latour, 1999).

The technologies of managing are enacted in different ways according to the part of the organisation of the process they are used. Their boundaries, working orders and outcome are fluid. They are vague and moving rather than being clear and fixed, and they are also able to create fruitful relations to make the object travelling in space and time. This travelling in places and times is unpredictable a priori, but the possibility for the object of being adaptable, flexible and responsive may prove to be stronger than a rigid one. They mobilise other actors, create a wrap of links that relate the object and represent to the other actors who have an interest in it. The technologies of managing are not passive but active producers of outcomes. This is how ANT perspective can contribute to the previous perspectives. The design is not simply produced by a vision of the designer, but multiple actors contribute in the creation and development, and it is materialised with the work of the spokespersons who are acting through different mediators represented by the technologies of managing. The technologies of managing are also a reflexive tool; they help the persons in the organisation to reflect upon the information. Also this thesis has played a reflexive role in technology of managing: by presenting it regularly to the steering committee, it stimulated considerations by reflecting on the observed networks, together with my supervisors we met the board of directors every six month presenting theories built on the observations conducted in the company. The managers started to mobilise some of the concepts presented in the dissertation to convey information. For example, the marketing director started to use the associated as disassociated features to mobilise the sales director, or the designer manager has expressed the intention to use the explanations of the design process to explain his work, the difficulties in the creative processes and the need for resources in the different stages.

6.3 Managerial Implications

The leaking black boxes are considered as a new technology of managing that can allow managers to take decisions and act on it, enacted by the recognition and relations of actors in the network; here the chairs are actors that are enacted and composed by different actors, emerging from the network, and managers seem to make decisions on them through the leaking black boxes, which are actors that are not closed totally, not black, but they allow a margin of negotiation. Therefore, the black boxes allow the management

by stimulus;[2] by acting on the translation process, managers stimulate the translation process, they stimulate actions and actively contribute to shape the network, including or cutting off the network actors and features, mobilising actors. For example Søren Hansen proposed the Eames chairs and the DAN to Arne Jacobsen, stimulating the translation of the Ant chair into the Serie7 and of the old chair of Landmansbaken into the Swan and the Egg. As it is managed by stimulus, many times the consequences are not clear or unintended, because the other actors in the network are stimulated and react to the stimulus, and their reaction is not happening always in an expected way. Even if the manager has a strong programme of action, if the actors are undisciplined (Latour, 1988), during the making process comes uncertain who the maker is, because it happens in the network, there are almost an endless number of actors involved in the process (Latour and Hermant, 2010) and the spokesperson cannot always expect that they are following his goals.

> *in this new rendering of others' interests, the contenders do not only try to shift them away from their goals. They simply offer to guide them through a short cut* (Latour, 1987, pg. 111)

The managers seem to stimulate actions by mobilising the actors. Managers, since are dealing with the complexity of the network, need to create frictions to test the resistance of the different actors constituting the network, to understand what is simpler and easier to change, for example the expectations of the customers, the requirements for the security, the interests of the museums, or the longevity of the material. These are examples of practical questions that the managers as spokespersons answer and act on by testing through friction, with continual adjustments and negotiated changes after the observations conducted (Callon et al., 1986). To adapt the design by modifying one of the aspects and performances of one of the constituents is to act upon the network, and its success thus depends on the capacity of the managers to test some specific resistances and to test whether the resistances are originated from which actor (customers, other employees, revenues, or materials that needs adjustments). The networks are complex, but managers need simplifications for making decisions and managing (Czarniawska and Mouritsen, 2009), and the networks described in the analysis can be simplified. The strength of the network architecture depends on the convergence of two networks: one that it simplifies and one which simplifies it (Callon et al., 1986). This means that managers creates two networks, one composed of simplified actors, which in turn are other networks, and one that displaces

[2]denomination suggested by Professor John Christiansen

the associated entities with their features and presents the leaky black boxes on which managers can act upon. While the leaky black boxes are susceptible to be created, forged, and defined, they in turn transform the network. The black boxes, instead, in this process disappear in order to permit the managers to simplify the network.

7
Conclusions

This dissertation proposes a new perspective on design management: management of design as a translation process, using a framework based on actor-network theory. This is a method for the socio-technical analysis that treats the actors as enacted and relational, exploring the network creation basing the analysis on a flat ontology, in which there is symmetry between human and non-human actors; there is no a priori size, power or complexity of the actors, but the reality is built on the relations and understood by following the connections between actors. In early June 2011, when I entered in the company of Fritz Hansen, my knowledge about design management was very limited. I was almost unaware of the writings by Latour, and my mastery of Danish was nonexistent. Because of these features, I was in the position of the ethnographer sent out to a completely new and foreign environment.
This thesis was performed according to the laboratory studies, which argue that the social is in the relationships, and it is advocated the use of an ethnographic method, because it allows to maintain analytic distance upon explanations of activity prevalent within the networks and the actors observed, minting an analytical distance upon explanations, activities and the organisation of the study, This dissertation is ethnographic because a distance with the society under study is kept. The study was enriched by the ethnomethodology, visual ethnography, and historical ethnography, without distinguishing the social from the technical. As ethnographic study, it incorporates reflexivity, achieved by making the networks, the features, the allies and the translations understandable from the context and explained to the steering committee. The meaning and the value was elaborated from the context, the reconstruction of the translations was performed after understanding the context and then following the actors in the various documents, combining the various sources. In the documents, it was annotated where

they were found, when they were written, for whom and to whom it was meant. For all the documents, the interviews, the field notes, the work of making sense of them was a back and forth process, among language, content, actors, traces left, network construction, and the underlying reality; the boundaries between the process of construction of the explanation, the data, and the resulting inscription of the interpretations blurs because they are all interdependent.
However, even if the process was carefully done and meticulously tracked, the dissertation presents the inevitable problem of fallibility, because the thesis, as a form of description, can be undermined.
Moreover, this analysis is the representation of one of the possible analyses, it could be otherwise; it is one of the possible interpretations, one of possible explanations. The text was enacted by the managers in Fritz Hansen during our meetings; it was discussed, mobilised and used as arguments for taking decisions at the strategy level. This enactment contributed to validate the study, since the managers agreed that it could be an interpretation of the past, and the network constructions, the features, and the technologies of managing helped the members of Fritz Hansen in the steering committee to reflect critically on the present actions, encouraging me and my supervisors to advise them.

The literature review revealed that the authors in the past perspectives were focusing on tools and on supporting the argument that management of design is an important field because it fosters innovation, it is considered a linear process, and frequently investigated as as an unproblematic process. In the previous perspectives, very little research was conducted to understand what happens during the life cycle of a product, nor discussing the micro processes, the networks of allies that are working for making the product successful. In the analysis it was demonstrated that the process is not linear, and in the discussion it has been proposed a new interpretation of the management of design.

This dissertation aims at answering to the stated problem:

> *How does a design product emerge if it is considered and understood as a network effect, and what are the managerial implications?*

The design is the outcome of relations among different allies, and the spokespersons for the design object need to work to enrol other actors so that they participate in the construction of the success of the design, to make the network bigger and more stable, to convey and to present to the customers and mediators features by associating or disassociating by it. The designer is not

the most important actor in the design process, as described in the previous literature review, but he/she is one among others. It has been demonstrated that the design is a macro-actor, since many actors are contributing in the design process, and it is an activity that is widely distributed in the network. The dissertation relies on the study of translations, looking into how the content and the context emerged, how the actors were convinced and became allies in the network, changing their mind in a smoother way, presenting associated and disassociated features.
The design emerges and becomes successful when there is a long chain of translations that are understood and distributed by involving many heterogeneous actors in the network. The design is mediating the information, and the managers as spokespersons present the associated and disassociated features, framing the customers, building thoughts about the object. The causes for the network construction and the value creation have been investigated, putting a particular focus on the role of designers and on the role of managers, that have been considered crucial in the previous literature. The managers, as they act as spokespersons are in charge of the translation process and they manage by stimulus, because they stimulate the actions, they create frictions and they act to simplify the process.

By considering the design as a network effect, the dissertation makes a contribution to:

- the role of designers, who are macro-actors;
- the role of managers, who become spokespersons;
- the value creation process: value is created in the relations, it is constructed by the meticulous work of the spokesperson presenting the associated and disassociated features, and the other actors accepting them, or mediating and translating to meet their goals and intentions.

The definition of value is flexible: it is a flexible construction, varies, is created in the relations, and managed through the translation process. It is the outcome of the construction of the social and of the technical tied together. The networks in the analysis make clear that there are a lot of alliances and allies that are holding the network, and through the relationships, they discuss, translate, but also mobilise other actors who accept the programme of actions and the arguments and help to displace the values.

Within the chosen analytical framework, the thesis attempted to answer to the following research questions:

How can different perspective on management of design be identified? Which are the past and the present perspectives on design and on management of design?

This questions were answered in Chapter 2, where four perspectives on management of design were identified. In order to determine which were the perspectives in the literature review, a technique for identifying the perspectives in management of design has been used, the co-word analysis. The co-word analysis was performed to look at how to describe the development and the differences among the researchers and the schools in design management in the literature. The analysis was performed for the first time in the field of management of design, and it was based on the argument of following the actors (the authors) and their argument construction.
The co-word analysis was implemented using the method based on key-words and focusing on analysing the content and assigning the keywords to the papers but not using the ones provided by the articles because in most of the cases they are not mirroring the content of the paper. This method produces an appropriate representation of the dynamic in the field.
From the co-word analysis and the calculation of the Jaccard index, three perspectives emerged.
The first perspective was added after having coded the articles and it reflected that the argument of the second and the third perspectives were based on the studies of Simon (1969). Therefore, a the first perspective was added based on this reasoning. Simon encourages the introduction of design studies in management schools because they could help managers in their decision-making process.
The second perspective is based on a linear process, and in order to successfully launch a new product, the stage gate model is recommended as main tool. The aim is to have a process that is integrating the design into the NPD for making the product more efficient and sellable at a higher price to produce value for the company. The method of investigation of the articles and books analysed ranges from case studies to surveys.
The third perspective explored the complexity of the management and the challenges that managers have to face for building an organisation that is capable of producing value for the society.
The fourth perspective was investigating how to create a radical innovative design product able to satisfy unmet needs of the society. In order to create a new meaningful product, the designers have to understand the evolution of the socio-cultural contexts.

How can management of design be understood through the lenses of ANT?

This question has been answered in Chapter 3 by understanding what is Actor- Network Theory, and then relating it to the constitutive elements of management of design explored in Chapter 2. The constitutive elements of management design include the design definition, the role of designers, the role of managers, the design process, the value creation process, the role of technologies of management. The chapter is divided in two sections. In the first, the concepts of what ANT and its philosophical negotiations (discussion on the metaphysics, essence, ontology and substance) were presented. In the second part, the understanding of the management of design was discussed. ANT considers reality as relative and co-constructed, existing only within the network and in the translations. For this reason, it has been indicated also as sociology of translations. Translation is a displacement, a drift, a mediation, a creation of a link that modifies the actors. As reality exists in the relations, the study of translations become the focus of the management of design, and it is possible because of the irreducibility of actors. Through the study of translations, a researcher can understand what an actor is, how it emerges and its mode of existence. The translations are trajectories when the spokesperson is actively transforming across the network. Agencies are shared in the networks, and an actor is what it is because it modifies the features through the relationships. Actors are not fixed entities, but they are semiotic and performative entities. They get together through the enrolment process, during which they agree to listen to the spokesperson and adhere to their program of action.
These concepts were used in building the analytical framework used in the analysis: defining the allies in the network in the different episodes, the translations, the enrolment, the mobilisation, the spokesperson and the features associated and disassociated.
By analysing design with ANT lenses, a contribution to ANT is also made: the clarification of the concept of macro-actor.

Which methods are suitable for conducting the analysis?

The dissertation is the result of an ethnographic study, using ethnomethodology in the way that is explained by Latour (2005), visual and historical ethnography. The method involves following the actors to depict the reality, because the social does not exist as prior objective reality. One of the advantages of this method is that it allows to study the way in which

actors attempt to create worlds and, consequently, the networks. Follow the actors is the motto. This permits to eclipse the difference between the macro-analysis and the micro-analysis, arguing that scale is the result of the translation processes, being the actors isomorphic. Thus, some actors become more important not because it is something embedded in their nature, but because of the power acquired during the translation process. One of the initial difficulties was the lack of organisational memory; it was very hard to find informations in the company, the museum was almost unused and not classified, people working in the company had a very little and fragmented memory. The memory was hard to be accessed; the old newspapers considered the diary of the company were conserved either in the basement or under a glass structure, very difficult to move; the informations for the '80s-'90s - 2000s were almost non-existent. In 2007 the company changed the ERP system, without taking any backup of the informations stored in the previous system. The organisation does not have an effective retrieval systems for its memory; there are stories about the designers and the artists who have been working in the company, but it is difficult to depict if and when they happened or were told to give me some piece of information. During the conducted interviews, I felt being in presence of an Alzheimer's-like corporate amnesia; the interviewees were unable to give me meaningful insights. When I was looking for data, I was told that the prior information concerning organisational structure, organisational events and organisational activities were not available, or they could be found starting from 2007, and I should have located the person in the organisation that had the files. Therefore, it was necessary to perform a visual and historical ethnography. The internal documentation related to the intellectual properties (copyrights, trademarks, brands, designs, ownership, partnering and licensing agreements) was non-existent. When I asked person in charge of the legal issues, but when I was asking for the contracts (for example McDonalds, collaboration with Paul Smith). I was told that they reached an agreement via email and they did not have the contract (even if I interpreted that there was a contract, but they did not know how to access it). Same story with the organised events. It was impossible for me to find a budget, a written document with a reflection on the activities, a collection with the latest press releases; the headquarter apparently only had slides with the presentation of the events. I had to go to the single shops where they were organised to find any information. The relevant material concerning events, curiosities, parties, was conserved in the GUF, and in the employees newspaper; however, as I did not have access to the intranet, I could not look at the previous issues, since there was not a place where they were conserved and stored. The sales people told me that

they would have liked to hear more from my thesis, that I should give a presentation of the results, because they are selling products but they do not have any idea of the story behind them, only few narratives and they doubted they were interesting.
In order to overcome these difficulties, I started to follow the traces left by actors during the different episodes in order to find the information needed. In theory, the realities/ networks in the different episodes were infinite. In practices, the networks were defined by a limited number of discrete entities/actors, whose features were well defined. The concept of simplification with the translation was used to delineate the reduction to discrete and limited number of actors, being aware that behind each actor there was a set of other actors that were drawn together.

In the analysis, the for each design it was reported

1. *Who are the actors in the networks?*
2. *What translations, mobilisation, enrolment, spokespersons can be identified?*
3. *What are the features of the products that are associated and disassociated?*

For each design object, the episodes were individuated from the analysis of the PLC.
The actors in the network are a heterogenous group of allies, including human and non-human actors. The spokespersons and the mediators work for building a network that is stable, based on numerous relations, so that the cost of challenging it becomes higher. In the analysis, however, not all the actors have been reported, being aware that there is an endless number of actors that participate at the network construction. For practical reasons, it was necessary to say stop at their research.
When some actors left the network, the spokespersons and the mediators worked to enrol new ones, to make the network less fragile and more stable. In the analysis, the technical and social aspects are treated in the same way, they are enrolled, they are faithful and they contribute to the achievement of the goals.
From the analysis, it is evident that the translation process plays a critical role in the enrolment process, it leads to associate and disassociate furthers about the design. The notion of translation is fundamental to describe the

mechanisms and the processes that permit to create the networks and the design processes. The translation process is a process and a mechanism that cannot be taken for granted, since it is one of the possible results, it could be otherwise. In order worlds and realities, they could have eluded the translations or not adhere to the programme of action through which they have been enlisted.

The spokespersons, managers were working on translating the features to the network, and the designer (macro-actor) was working for mediating the translations to the allies contributing to strength the network of allies. When the chain of translations is longer, the design is better accepted and the allies agree to work for, it showing a higher displacement, drift, invention, mediation, the creation of a link that did not exist before and that to some degree modifies two elements or agents. Therefore, when many links are created, higher is the likelihood that the program of action is understood by the different actors and successfully mediated. The number of allies mobilised changes from one episode to the next one, some leaves, other joins the network. The spokespersons were working for solving the struggles and keeping the actors attached to the network, also mobilising and delegating functions to the non-human actors to successfully enrol humans in their program of action. In the analysis, the weight of what counts or what does not count was never pre-determined, but it was the result of the translation process, directed by the spokespersons. In all the episodes, the identified spokespersons for the design were the managers of the companies where the design was produced. During the development phase, the actor that was called designer is a spokesperson in the product development phase of some objects, but mainly he/she was a mediator, helping the translation process. The designer is a macro-actor, an actor representing a collective group of actors that are contributing to the fate of the design and its chances of success, giving shape to the design during the process, transforming it until a market is built, and it constantly convinces other actors to be enrolled in the network and the customers to buy it.

The spokespersons use the black box as frame to align, enrol and negotiate the interests of actors, and as one of tools to enrol them in the construction of facts.

The features associated and disassociated in the first episodes of the all the three chairs are similar, they are associated with the features of being modern, mass produced, high design for large number of persons. However, during the episodes the features associated and disassociated changed, modified and some features that were associated in an episode, were disassociated on that the following one. This process creates value, and value is generated

in the relationships
This is a contribution to ANT theory, in which the spokesperson is not only speaking on behalf of a programme of action, but also he works for constructing value by associating and disassociating features.

The research question

> *the implications for theory (learning from ANT versus using other perspectives), and the role of technologies of managing in the process, and which technologies are mobilised and which are used to manage design*

is answered in chapter 6, explaining how the analysis based on ANT framework can help to contribute to the previous perspectives, and focusing on the role of the black boxes, leaky black boxes, and the brief as a mediator transporting and transforming information. The dissertation provides also contributions to ANT: a clarification of the concept of macro-actor, the role of spokespersons in associating and disassociating features, and the use of leaky black boxes as technologies of managing.
The ANT does not distinguish clearly between spokespersons and macro-actors. The spokespersons are defined as actors that are speaking on behalf of the network, responsible of the translation process, and working for associating or disassociating certain features. The spokespersons, according to the literature and to the results of the analysis, are the managers of the firm. The macro-actors are actors which represent another network, they are representing the actions and the actors that worked for a determined programme of action. The macro-actors, according to the analysis, are designers, because they represent the whole actor-world that is supporting the design process. The simplification that leads to identify the designer as a macro-actor is the result of the translation process. Theoretically, the reality and the network construction are infinite. Practically, the network is limited to a series of actors whose characteristics are defined, they are the results of the translations that it generates and of the simplification process that is brought about consequently, creating macro-actors that represent the simplification of the network.
In the episodes, the black boxes and the leaky black boxes were individuated. The leaky black boxes were described as black boxes that were not totally closed, and managers could act to stabilise them, or they mobilise and use them as managerial technologies to transmit information, take decisions in an unproblematic way. For example, the veneer was stable, black

boxed, ready- made, but when an incremental innovation happened, it became leaky, because it slightly changed and the manager had to work for closing it. The managers enrolled other actors in the network also by mobilising the black boxes, and to solve controversies without being questioned too much. For example, Scandinavian and Danish design were black boxes because the network agreed on their meaning and on the features they were associated with.

Concerning

Managerial implications (what does management mean if design is considered a network effect)

in this thesis, managers seem to act as objective spokespersons, able to speak in behalf of many actors, which agree on their activities and goals. The designers, which are macro-actors agree on the translated the goals and their programme of action, and participate at the construction of the design.
Managers work for creating value by associating and disassociating features. The value is in the relationships, therefore they work to create numerous relations, strength them and ensure they can be stable enough to make value emerging. The market is not fixed, the features presented are changing from episode to episode. Some features lose value, others become important; for example, hand-crafted was a quality that the managers were heavily working against, in the first episode, while in the last episode of the Serie7 and of the Egg it was one for which they were working for. Therefore, the marketing managers do not have to struggle to present the object with some fix characteristics that are defined by the customers, but to frame the features for the customers, help them to understand the qualities and start a qualification process. This overcomes the traditional theories in which the customers are passive adopters of the products, or the tastes are pre-given; managers seems to realise that the customers are adopting the design while they are actively adapting it, framing the translation and deciding if to adhere to the proposed programme of action.
Managers manage through stimulus by stimulating actions (for example by translating, associating or disassociating) or by creating frictions to stimulate the simplification process, acting upon the leaky black boxes and use them as technologies of managing for making the managerial process more efficient.

7.1 Limitations

The thesis was a translation of information, communications, continuous framing of ideas with my supervisors, of constructing of the reality inscribed in the thesis by translating the information (also translating in different languages), in translating data inscribed in ethnographic field diary into the software for analysing them. I tried to follow the actors, interpreting the traces that were left, and the thesis is the inscription of their enactment. However, it has been an actor mobilised for having feedback from the steering committee and confirming its validity. The strength of using this qualitative method is to have rich details, unexpected categories emerged in the process, the research questions were generated through the work in the field, the results have been concrete and detailed, and they were relevant for Fritz Hansen. However, this research can be criticised for being anecdotal, that three objects to be studied might not be enough, and that the interpretation of a single researcher can be unreliable, biased, not objective (Anderson, 2012). But, being a co-constructivist researcher, the belief is that the thesis could have been otherwise, and I followed the actors without judging them, recording their actions. During the field notes, I carefully noted the language in the organisation, in the documents, in the shops, what was said, by whom and to whom, studying in and of the networks construction. However, at the beginning, it was difficult to grasp what was going on, the context was unknown, the observations were difficult to make, the field notes were not very clear, and I was inexperienced. As noted previously, the data are construction of the organisation, they are translations in texts, sometimes were given by the organisation, other times found in the libraries. Therefore, the managers could have given other data or other documents to another researcher and the final result of the thesis could have been different. The initial intentions were to look at the actions of the actors, how they built their relationships, how a design emerged among different competing ones, which were the struggles to be overcome. However, the data were historical memories, historical newspaper articles or catalogues. In this kind of material, it is rare that the history of struggles is described. What it is usually described are the winning stories, not the lost battles. Therefore, I had to shift the focus and not looking for the struggles and alternatives designs.
In the analysis only the firm's perspective was analysed, missing the point of view of customers and the way they have framed the product (see for example Christiansen et al. (2010)), since the product is in the hand of the customers/end users (Latour, 1987). The focus has been on the object and in the firm, on the role of the designers and managers, the qualification

processes made by the framing devices and the reactions of the customers were not analysed. This could have been done to have a more complete study on the relation between association/disassociation of features and the qualification/re- qualification processes and perception of the customers.

7.2 Future Research

In the analysis and in the discussion it was pointed out that value is created in the relationships. Actors are persuaded by the spokesperson about the values, they adhere to the programme of action. But how is this happening? How can the framing devices actually contribute to the change of mind? Is it possible that they are connected to the sense-making process? How is this related with the translation process?
In the analysis, the production seems to play an important role in the development of the chairs. Without the contributions of Fritz Hansen, for example, the firm and Arne Jacobsen would not have been able to design the Ant chair. The involvement seems crucial. In the presence of a globalised world, where the factories and the productions are moved to other countries to save costs, what does it mean in terms of productivity and competitiveness? Can companies still develop innovative products without the feedbacks of the production? Which impact does it have on the innovation and design process?
In the managerial implications I have argued that managers seem to become strong spokespersons, but how is it possible to calculate or define a strong/weak spokesperson? Why are some relations stronger than others? Is it possible to commensurate them?
Furthermore, in the future studies it would interesting to explore the role of performativity, intended as the claim that design has an effect on reality, enacting it, how it is displaced in space and time, and how it changes. As the main focus of the research was understanding how the micro-processes are happened, how they emerged, it could be interesting to develop a research aimed at understanding how a product design emerges and how is the product development process managed when it is considered the result of a network construction.
Finally, another proposal for a next research is to explore more in detail the value creation concepts and investigate, concerning the innovation and the management of design, what are the markets for a specific object and how do they are framed in developing countries; what is described as value, for whom, how it is framed in emerging economies, how it is different from

Europe; through what tools this value creation can have to be investigated and made it governable, in order to increase the competitiveness of the companies in a global setting. Is it possible to mobilise the values in different markets and evaluate their performance?

8
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Appendix A

List of codes for the co-word analysis

This is the codes, the arguments attributed to each paper analysed, on which the Jaccard index was performed.

Ahire, Dreyfus: 1999: design, process, operational level, quality, performance, experience, industrial design
Ahmadi, Roemer, Wang: 2001 : competitiveness, exploration. NPD. information management, design process , cost reductions, technological
Alizong; shooter, Simpson: 2007: PLC, design process , marketing, modularity, competitiveness, costs control, efficiency, effectiveness, experience, value
Atwood, McCain, Williams 2002: problem solving, management framework, technological, NPD, customers needs, decision making, design process , NPD, different activities for each stage, efficiency, design identity, personalisation
Auger: 2005 : website, performance
Boland, Collopy: 2004 : impossibility decision making, innovation, bricolage complexity, skills, team management, design thinking , action, managing as designing, problem solving, language, creativity

Boland, Collopy: 2004: decision making, design thinking, idea generation, managerial framework, sustainability, structure, value
Borja de Mozota: 1998: strategic, design thinking , performance, value, competitiveness, team management, price, marketing, R&D, 4P of Porter, corporate identity, experience, functional, usability, project management , portfolio management, supply chain management, operational level, technological change
Borja, Clipson: 1990 : marketing, strategic corporate identity, value, creativity, quality, strategic , costs control, cost reductions, legal issues , performance, planning, customers needs, SGM, NPD, aesthetic, team management, performance, visceral, functional and emotional design, usability, value, KPI, portfolio management, product success, tools for facilitating, project management, competitiveness, marketing
Bradbury: 2004 : power, complexity, strategy, structure, sustainability, team management, leadership
Bruce, Daly: 2007: marketing, communication process, corporate identity, value, creativity, quality, strategic, costs control, cost reductions, legal issues, performance, planning, customers needs, SGM , NPD, aesthetic, team management, performance, visceral, functional

and emotional design, usability, value, KPI, portfolio management, product success, tools for facilitating, project management, competitiveness, marketing
Bruce, Morris: 1994: external vs internal designers, industrial design, management framework, NPD, project management, marketing
Buchanan : 2001: managerial framework, national policy, planning, power, design process, communication, managerial framework, communication, product design, symbol, form function, sustainability, aesthetic, desirability of the product, usability, identity, industrial design, NPD value, knowledge management
Buchanan : 2004: design thinking, entrepreneurial, function, sustainability, idea generation, problem solving, value
Buganza, Dell Era, Verganti: 2009: NPD, turbulent environment , flexibility , technical possibilities
Buganza, Verganti: 2006: customer needs, unforeseen, efficient, turbulent environment, PLC flexibility, NPD, incremental innovation, distributed knowledge, strategy, diffusion, dominant design, technical possibilities, observation, decision, service
Candi: 2010: aesthetic, innovation, technological, industrial design, service, price, costs control, visceral, functional and emotional design, communication process, customers needs, technological, customer loyalty, customer participation, consumer behaviour, performance, marketing quality, value, NPD , corporate identity, websites, Candi: 2006 : performance, innovation, NPD, industrial design, performance, investment, quality, usability, experience, value, marketing technology, auditing, durability, costs control, cost reductions, visceral, functional, and emotional design

Chiva and Alegre: 2007: design process , design process, customers needs, performance, innovation, supply chain management, marketing, KPI
Chiva- Gomez: 2004: competitiveness, performance, NPD, knowledge management, modularity, strategic, creativity, information management, decision making, knowledge management, tools for facilitating, experience, external vs internal designers, competitiveness planning performance
Chiva- Gomez, Alegre-vidal, Lapiedra-Alcami: 2004: performance, efficiency, innovation (increase), competitiveness, NPD, decisions (efficient), management framework, technological, strategic, market/ customer, demand/ needs, different design sources, communication process, different activities for each stage, creativity, building financial indications, KPI, 4P of Porter, silent design, design process, role of manufactures, external vs internal designers, product success, PLC costs control

Chung: 2004: analytical skills, leadership, entrepreneurial, management of resources, sustainability, competitive advantage
Collopy: 2004 : managing as designing, language creativity, leadership
Cook 2004: actions, language, meaning, skills, knowledge management, problem solving, social pressure, symbol
Cooper, Bruce, Wootton, Hands, Daly 2003: innovation, culture, sales, KPI, design process, SGM , customers needs, supply chain management, aesthetic customer, loyalty, quality, performance, safety, regulation for improving and implementing design, value
Coughlan : 2004: sustainability, complexity, organisational design, design thinking, planning, organisational goal, problem solving, prototyping, sustainability, tools for change
Czarniawska 2004: action net, actors, organisational design, collective actions, connections, imaginary intellectual activity, management framework, managing as designing, managing

as designing, nature of language, organisational design, actions
Dell Era, Marchesi, Verganti 2008: strategy, design driven innovation, socio cultural paradigm, quality, competitive advantage, external interpreters, distributed knowledge, market pull, NPD, language, technical possibilities, semantic, internal R&D, semantic, socio cultural paradigm, design discourse, diffusion, observation, radical innovation, external interpreters, identity, dominant design, designers meaning, socio cultural paradigm, strategy, language managers

Dell Era, Verganti 2007: design driven innovation, external interpreters strategy, language, diffusion, meaning, visions, radical innovation, user centred, observation, designers, behaviour , involving design, firms, aesthetic, style, making sense, semantic production, distribution, customer needs, distributed knowledge, profit, evolution, dominant design, technical possibilities, language broker

Dell Era, Verganti: 2009: aesthetic capabilities, competitive advantage, customer needs, design discourse, design driven innovation, distributed knowledge, external interpreters, flexibility, identity, language, market pull, language broker, meaning, making sense, proposal, visions, radical innovation, technical possibilities
Dell Era, Verganti: 2011: aesthetic capabilities, competitive advantage, customer needs, design discourse, design driven innovation, distributed knowledge, external interpreters, flexibility identity, language, market pull, language broker, meaning, making sense, proposal, visions, radical innovation, technical possibilities
Dickson, Schneier, Lawrence, Hytry: 1995 : cost reductions, industrial design, quality, design process, NPD service, supply chain management, R&D
Engestrom 2004 : actions, language, decision making, language, imaginary power, planning structure, strategy, skills value
Era, Marchesi 2008: aesthetic, external interpreters, designers, involving design firms, socio cultural paradigm, distributed knowledge, competitive advantage, meaning, semantic, socio cultural paradigm, NPD, language, technical possibilities, aesthetic
Fuller, Matzler 2007 : innovation, technological, customer participation, customer loyalty, knowledge management, R&D
Fynes, Voss 2002 : performance, supply chain management, quality, industrial design, management framework, design process
Gabrielsen, Kristensen, Zaichkowsky: 2010 : competitiveness, innovation, NPD industrial design, corporate identity, design identity, price, supply chain management, branding, knowledge management, information management
Gehry: 2004: analytical skills, collective actions, function, decision making, sustainability, value
Gerber, Carroll: 2003: team management, tools for facilitating, design process
Gerber, Carroll: 2012 : customer loyalty, tools for facilitating
Goguen 2004: meaning, uncertainty, complexity, flexibility, impossibility, decision making, problem solving, sustainability
Grant 2004: entrepreneurial, managing as designing, complexity, creativity, power, resources
Hargadon and Sutton: 2000: team management, creativity culture, innovation, efficiency, Organisational levels, knowledge brokering, knowledge management, information management , investment
Hertenstein, Platt, Veryzer: 2005 : industrial design, performance, KPI, investment, costs control, value

Heskett: 2001 : design identity, customer participation, creativity, culture, customer loyalty, design process, strategic value, usability, sustainability, strategic, market, customer, demand
Hoskin: 2004: idea generation, decision making, design process, structure, innovation
Ivory, Thwaites, Vaughan: 2003: strategic, customer loyalty, customers needs, innovation, performance, reliability, durability, design identity, service, supply chain, management, cost reductions, operational level, organisational level
Jayaram, Ahire, Dreyfus: 2010: quality, industrial design, team management, design training, culture, performance, KPI, information management, operational level
Jun 2008: strategic management, framework, decision making, PLC, customers needs, planning, project management, team management, resource allocation, auditing, branding, corporate identity, culture, costs control, service, innovation, technological, building financial indications
Kleinsmann, Valkenburg: 2008: team management, project management, communication process, quality, tools for facilitating knwoledge management innovation quality SGM, decision making, marketing, NPD

Krishnan, Ulrich: 2001: value, NPD, decision making, competitiveness, management framework, SGM, performance, portfolio management, strategic marketing, design process , operational level, industrial design
Kristensen 2004 knowledge management creativity information management knowledge management value tools for facilitating the process Kristensen, Gabrielsen, Zaichkowsky: 2012 : marketing, corporate identity, business model, performance, customers needs, customer loyalty, costs control, aesthetic, 4P of Porter, creativity, innovation, quality, price experience, meaning, experience, design identity
Kujala, Nurkka: 2012 : meaning, consumer behaviour, meaning, corporate identity, design identity
Kumar, Wellbrock 2009: price, NPD, control, quality, design process, strategic, planning, decision making, team management , SGM , communication process tools for facilitating
Kusiak: 1994: industrial design, marketing planning, investment, reliability, quality, modularity, design process , SGM
Lam, Wong, Chan: 2006: design process, communication process, project management, performance, planning, NPD, SGM, quality, aesthetic, adaptability, usability, efficiency, value, KPI

Liedtka: 2004: design thinking, learning, complexity, connections, organisational goals
Love : 2002: team management, knowledge management, operational level, culture, problem solving, creativity, aesthetic, ergonomics, value, tools for facilitating, planning

Lyytinen: 2004: planning, organisational goals, organisational design, leadership, knowledge management, inscriptions, resources, skills, uncertainty, complexity, competitive advantage

MacCormack, Verganti, Iansiti: 2001: NPD, customer loyalty, costs control, technology, design process , flexibility, innovation, team management, SGM , customers needs, value, experience, tools for facilitating, modularity

Mesa, Alegre-Vidal, Chiva-Gomez, Gutierrez-Gracia: 2013: performance, operational

level, design process, SGM, Organisational levels, operational level, creativity, innovation, NPD customers needs, aesthetic, efficiency, effectiveness, decision making, team management, investment
Muntanen : 2008: organisational level, NPD, team management; design process
Niedder: 2012: visceral; functional and emotional, design; experience
Normann 2007 : visceral, functional and emotional design, tools for facilitating, strategic
Odennel, Duffy: 2002: performance, PLC, flexibility, effectiveness, NPD, KPI, efficiency
Paradiso: 2004: aesthetic , innovation, connections, collaboration, improvisation, organisational design
Pekta and Pultar: 2006: organisational level, design process , information management, knowledge management, costs control, decision making
Person, Schoormans, Snelders, Karjalainen: 2008 : strategic branding, sales, decision making, PLC, value, portfolio management, corporate identity, team management, visceral, functional and emotional design, quality, efficiency, durability, exploration, functionality, usability, technological positioning
Pisano, Verganti: 2008 : decision, capabilities, competitive advantage, external interpreters, strategy, proposal
Pullman, Gross 2004 : experience, customer loyalty, customer participation, incremental innovation
Randall, Terwiesch, Ulrich: 2005: customers needs, design process, tools for facilitating, incremental innovation, customer participation, NPD, sales, exploration, experience, SGM, customer loyalty, performance, price quality
Randall, Terwiesch, Ulrich: 2007: customer participation, decision making, customer loyalty, industrial design, role of manufacturers, performance, design process , NPD, value, usability, visceral, functional and emotional design experience, positioning
Ryd: 2004: industrial design, tools for facilitating, NPD, innovation, decision making, planning, quality, management framework
Sun; Williams, Evans : 2011: conceptualise, design practice, stakeholders, management, value , role of designers, marketing, strategic , exploration, risk taking , meaning, SGM , NPD, design, planning, strategic, decision making, legal issues, performance, resource allocation, tools for facilitating, sustainability, corporate identity, problem solving, knowledge brokering, design thinking, 4P of Porter, Balance Score Card, role of manufactures, information management, external vs internal designers, supply chain management, customers needs, training, project management, design policy

Sung and You: 2007 : auditing, design auditing platform, regulation for improving and implementing, design performance, internal design, competences, British design council, Organisational levels, strategic, planning, design policy, design identity, knowledge management, design training, control, efficiency, efficacy, cost reductions, usability, reliability, adaptability, easy to understand, relevance, personalisation , layout, operational level, design process
Tung : 2012: decision making, industrial design, tools for facilitating, customer participation, design process, knowledge management, problem solving
Twigg: 1998: knowledge management, design process, competitiveness, quality, supply chain management
Ulrich: 2006: aesthetic innovation, NPD, marketing, customers needs, customer participation
Ulrich 2011: problem solving, NPD, SGM, aesthetic, customer participation

Ulrich, Ellison: 2005 : industrial design, external vs internal designers, planning, SGM, NPD, internal design competences, consumer behaviour, customers needs, performance, contingency, decision making, Organisational levels, costs control, operational level, R&D
Ulrich, Ellison: 1999: NPD, customers needs, decision making , investment, modularity, performance, external vs internal designers, costs control, operational level, efficiency, modularity

Verganti: 2006: competitive advantage, capabilities, design discourse, customer needs, design driven innovation, identity, incremental innovation, emotion, technical possibilities, managers , marketing

Verganti: 2009: socio cultural paradigm, aesthetic capabilities, competitive advantage, customer needs, design discourse, design driven innovation, distributed knowledge, external interpreters, flexibility, identity, language, market pull, language broker, meaning, making sense, proposal, visions, radical innovation, technical possibilities, semantic, language, proposal, visions, emotion, making sense

Verganti, Buganza: 2005: NPD, customer needs, observation, PLC, technical possibilities, decision, external interpreters, strategy, radical innovation, competitive advantage, flexibility, capabilities, service, performance, modularity, incremental innovation, external interpreters
Veryzer: 1993 : consumer behaviour, marketing, quality, market/ customer demand, competitiveness, competitiveness, different design sources
Veryzer: 2005: marketing, industrial design, NPD, innovation (increase), innovation, R&D, team management, technological, value, customer loyalty, customer participation, usability
Walsh: 1996: industrial design, innovation, strategic, SGM, sales, project management, problem solving, value, price, planning, performance, Organisational levels, NPD, marketing, market/ customer, demand
Walsh, Roy, Bruce: 1988 : industrial design, design policy, price, operational level, marketing, quality, value, competitiveness, technology, aesthetic, durability, reliability, safety, usability, competitiveness, value, customer loyalty, customers needs, marketing, operational level, performance, KPI, strategic, price , sales, customer participation, costs control, corporate identity, innovation, incremental innovation, SGM, team management, tools for facilitating, value, NPD, design process, investment

Wegner: 2004: planning, creativity, managing as designing, planning, impossibility, decision making
Weick: 2000: bricolage, sense-making, decision making, design process , identity
weick: 1999: bricolage, problem solving, analytical skills, complexity
weick: 1993: sense-making in the organisation, organisational disintegration, improvisation, roles in the organisation, confidence, leadership, intersubjectivity, social pressure, language structure, planning, communication, history of the group, organisational goals, meaning, managerial framework, intimacy, fit
weick: 1999: collaboration, organisational goals
weick: 2004: sense-making in the organisation, bricolage, impossibility decision making
Yassine, Falkenburg, Chelst: 1999: NPD, SGM ,Modularity

Appendix B
Field Journal

This is the summary field journal. It is the synthesis of what I have been doing during the ethnographic study, from the writing of the PhD proposal to the writing up of the thesis. Not all the days were dedicated to the research or the field work, but also to teaching obligations, dissemination activities and involvement in extra- activities. The diary and the memos were taken with pen and paper, therefore not digitalised and not attached in the appendix.

11/10/2010- 16/10/2010: First PhD course; the purpose of the PhD course is to investigate relations between organisation studies and accounting. More specifically, the aim of the course is to explore relations between calculative practices and organisational action. Any performance measure is a calculative practise that renders certain aspects of organisational practices visible; at the same time calculations, their representation and mobilisation are framed by organisation. Hence the course wants to shed light on the organisational construction and consumption of calculation on a variety of issues. This course was very challenging because I was at the very beginning of the PhD and I could not relate to my fieldwork. However, it helped to develop the interest in ANT

January 11- 2011: Application for the PhD

01/05/11: Official start of the PhD program

02/05/11: Preliminary reflections on Fritz Hansen: what do I know? What shall I expect? Collect information about the company economies, financial statements, design philosophy. Reflections.

03/05/11- 22/05 11: Preparation for the meeting at Fritz Hansen: what is this company, what it is doing, communicated design strategy. Reflecting on what counts as adequate or valid research, how can I be sure reliable knowledge is created? How are facts established? What are our underlying assumptions? How to be persuasive? How shall I collect data and classify them? How shall I organise the data collection?- Yin case study/ qualitative case studies/ ethnographic method of data collection. Reflections of which kind f researcher I am (using Burrell and Morgan (1979) matrix)

*23/05/1*Design@CBS: 14-17.00, with the purpose of get to know one the other researchers on design at CBS and the existing design-related activities at CBS and start a conversation how we see design at CBS evolve in the existing diversity and potential future collaborations, that may lead on to large scale research funding applications.

25/05/11: Design conversation at CBS, meeting on design management in different fields.

28/05/11: Product development group gathering together- presentation of my PhD proposal.

01/06/11: Meeting in Fritz Hansen. Agreement on the time-frame, confidentialities issues, products to analyse, use of the materials, objectives of the study, expected outcome. Worries: managers lacked of time and they did not know how much they could follow me.

02/06/11: Presentation of the research at Fritz Hansen: The aim of the present research is to understand how different framing devices and processes have influenced the life cycles of different products. Framing devices a recently concept, that includes processes, devices and/or actors that are used, more or less intentionally, or that influence how products are presented to the customers and how customers perceive the products and acts upon them (e.g. buy or refuse the products). The analysis will deal with how different processes and actors relate in networks that produce the value construction. The scope will be to identify the framing devices that are influencing the life cycle to map what framing devices has been used and/or influenced the PLC, when they have been used, what was the role of management, what considerations did management have and what was the role of different actors, e.g. sales, marketing, production and designers in the framing of products? This will produce multiple cases and PLC's presenting the role of different framing devices, and provide an opportunity to compare across different product PLC's and to analyse patterns from cross-case analysis. This requires data on the product-life-cycle of the products and information on the actors and the processes related to each specific product PLC, to identify the framing devices. Actually we build a case on PLC of each product, as illustrated in the published paper on the Egg: Living Twice: How a Product Goes through Multiple Life Cycles. Preliminary data will be collected on site at Fritz Hansen in the last weeks of June 2011, based on interviews with a small number of key-informants and additional data (brochures, archives and so on). The material will be used for analysis in July and we hope to be able to present a draft report to Fritz Hansen by the end of August 2011. The material from Fritz Hansen and interviews will be supplemented with studies of external material (books etc.). I proposed to use the material for additional analyses in my PhD dissertation work, that is due in spring 2014.

04/06/11: IPDM doctoral workshop, Delft: The doctoral workshop was developed with the aim to stimulate academic scholarship, discussions of ideas and dialogue among students and researchers from different countries in the field of Product Development Management research. The workshops were interactive doctoral workshop. We were PhD students in early and middle stages of the PhD research project. We were particularly encouraged to participate and present their research proposals, preliminary results and their reflections on issues related to theory, methods and analysis. Sessions were organised in smaller groups with one or two senior researchers in each group, but there will also be plenary sessions on

topics of general interest, e.g. on how to get your research into journals and methodology issues. The groups were created to provide diversity across institutions so we all get exposed to a mixture of topics, projects and ways of doing research. Chairmen for the PhD workshop: Professor Armand Hatchuel, Mines ParisTech, Paris and Professor John K. Christiansen, Copenhagen Business School. Pep-talk 1: Armand Hatchuel – Why Management studies are different from other types of research;
Pep-talk 2: Abbie Griffin – Investigating the relationship between NPD and performance
Thoughts and reflections on challenges on doctoral projects from yesterday; Publication and dissemination strategies for Doctoral students; 13,00 Working in the groups (part 1: presentations)
Professors present: Arnmand Hatchuel, Professor, Ecole Des Mines De Paris, John K. Christiansen, Professor, Copenhagen Business School Dept. Of Operations Management, Thomas, P. Hustad, Professor, Kelley School Of Business Indiana University, Keith Goffin, Professor of Innovation and New Product Development, Director Centre for Innovative Products and Services, Abbie Griffin, Professor in marketing at the David Eccles School of Business at the University of Utah, Paul Coughlan, Professor of Operations Management at the School of Business, Trinity College Dublin, Anthony Di Benedetto, Professor, Fox School of Business and Management, Temple University, Philadelphia, Klaasjan Visscher, editor-in-chief Creativity and Innovation Management, University of Twente, Christer Karlsson, Professor, Department Of Operations Management, Copenhagen Business School.
It was the first time I have heard different opinions, different strategies, different suggestions: need to focus on the RQ and methodology, to be able to answer when questioned.

05/06/11: IPDM doctoral workshop, Delft; reflections on my project and proposal for developing a method and interesting research question. It has to be original and not repeat something already existing.

06/06/11: IPDM conference, Delft: "Innovate through Design": presentation of the paper: open innovation as a flexible design management tool.

07/06/11: IPDM conference, Delft: "Innovate through Design".

*08/06/1*1: seminar contributions about my PhD- reflections on what I would like to contribute, which is my domain field, the methodology, and which are the results that I wish to obtain.

10/06/11-20/6/11: starting to work on the paper on Open innovation and design management as technology of managing tool, after the good feedbacks obtained at the conference.
Based on the Egg paper and Yin preparation for a week the document outlines what I wanted to collect, why, and how, and the organisation of the collected data.

11/06/11 Submission of the Open Innovation Paper to the RTM journal.

14/06/11: PhD meeting and coordination with the LIMAC school: guidelines, presentation of the research questions, timelines.

15/06/11: PhD biannual report completed: presentation of the PhD plan and mile-

stones to reach.

16/06/11: Fieldwork in Fritz Hansen- Presentation of me in the company; reflections on: how do I observe? Watching, listening, asking questions, making mistakes...How do I record? How do I write field notes? Audio, visual and electronic recordings? How do i write a field diary? Remember to make notes during or as near as possible to interactions Make notes at the end of the day; Reflect (more notes); Review – live with my notes— reflect on them.. but how? preparation of a table for memos.

17/06/11: Fieldwork in Fritz Hansen- entering the field, understand the organisation and the head- quarter, getting familiar with that.

18/06/11: Final preparation of the questionnaire for the first round of interviews in Fritz Hansen.

Questionnaire FH version 1: First round of interviews

1. Introduce my self and the project:

I would like to divide the interview in 2 parts. The first one focuses on understanding the life cycle of the products. In the second part I will like to focus more on the role of designers and other actors in the process.

2. Personal background

a. How long have you worked here (for/with FH) and what is your background?
b. What is your main activities in/for in the company/FH?
c. In general, how will you describe the way FH works with product development and marketing of products?

3. Product life cycle for the product : (insert name):

a. If we can start from the beginning, where did the idea and concept for the product come from?
b. Who was involved in the start of the process - and what was their role(s)?
c. How would you describe the product development process?
d. What was your role in the process?
e. How did FH promote the product and who was involved in that part?
f. Has there been changes to the product over time? What - and why? Who was involved? Why?
g. Has there been changes in the promotion (marketing and sales strategies) of the product over time? What? Who was involved? How?
h. Can you describe how the product sales has evolved over time?
i. Are there different phases or important situations or actions that divide the product life cycle into different phases? (Sales up and down?)
j. In the previous paper we have identified, for each phase, significant actors and events that affected the life cycle of the Egg. Which one would you think would important for influencing the sales of the other products?
k. If we divide the life of this product into different phases, would you be able to describe them, to give a sort of label to define them?
l. Has FH and the management at FH tried to influence and/or change these phases/processes over time? How? When? Who?

m. Is there any curious (special) stories that you would like to tell me about the product? That might be important to understand the development and life of the product?

4. Phases/ qualities/crises?
a. What are the strengths of this product as you see it?
b. What makes the product special?
c. How would you define the product and it qualities?
d. Has the features and qualities changed over time?

5. Other actors
a. Besides those you might already have told about are there other important events or actors that has influenced the development and life of this product? Who and/or what?

6. Designers
a. Who did come up with the design idea for this (X) product?
b. How would you describe the interaction and relationship between this designer and Fritz Hansen?
c. Did the interaction between the designer and FH influence the development of product - and/or later modifications/changes to the product? How - and why?
d. Is this a typical or normal way to develop a new product in FH?
e. How do you in general se the role of designers in FH?
f. What are the main challenges in working with new product development in Fritz Hansen today?
g. Have the interaction, processes and relationship between the company and the designers changed over time? How? Why?
h. Do you have suggestions for ways that Fritz Hansen could improve the interaction and use of designers in the future?

7. I have no further questions. Is there anything you would like to bring up or ask about before we finish the interview?

8. I am at the very beginning of my project and I might need further information when the analysis of the data starts. Would it be possible for me to contact you later for short follow up questions? How can I contact you?

20/06/11: Interviews in Fritz Hansen- 01.00pm, meeting room A - Head of Design; than field observation.

21/06/11: Interview Fritz Hansen- 09.30am, meeting room A - Brand operations - Graphic Design, than field observation.

*22/06/11*Interview in Fritz Hansen- 09.00am, meeting room D - Peter Harding Sørensen and Søren Paag Rasmussen (students who made a project for Fritz Hansen regarding the pricing of Series 7)- 11.00am, meeting room D - Kasper Salto, Designer, than field observation.
Submission of the paper: IMPROVING DESIGN WITH OPEN INNOVATION: A BENDABLE MANAGEMENT TECHNOLOGY.

23/06/11: Field work in Fritz Hansen-01.00pm, meeting room A - Brand Operations - Architects and end-user responsible.

24/06/11: PhD workshop on Philosophy of Science in management studies- reflections on the need of writing a chapter on that and be clear to myself which are the lenses of the analysis.

27/06/11: Field work in Allerød- collection of material defining the design timeless and classic, using the magazines that are there available, and talking with people in coffee breaks and during the lunch.

28/06/11: Field work in Copenhagen; Visit in the studio of Kasper Salto.

29/06/11: Field work in Allerød, interacting with the marketing department.
Preparation of the questions for the consumers/ users of the chairs:
Questionnaire:

I am doing a Ph.D at CBS and the aim is to understand why the sales of the 7Series, PK22 and ICE chairs are moving up and down over time, and how costumers perceive these products, (getting inspired by a research from Kristensen)

Personal background:
1. Age group
2. Occupation present:
3. Highest education:
4. Type of home: Flat, house or ??
5. Do you have a special interest in design furniture? What?
6. Are you especially interested in Danish design and furniture?
7. Have you furnished your home in a special way or with special designs/designers)?
8. What is the main attraction of Danish design?
9. What was the first Danish furniture you owned?
10. Why did you select this product?
11. Which furniture do you remember clearly from your childhood?

Do you own and/or use any of these products xxxx,xxx,xxxx,xxxx (all versions???)
1. Why have you chosen this product?
2. How would you describe this product? Which are its attraction(s)?
3. What is makes the product so special? Please describe.
4. What does it mean to you?
5. Are there any particular memory or situation you are linking to it?
6. Are you ever thinking to re-sell it?
7. Would you buy new pieces?
8. Do you know which factory produces this product?
9. What is most important: The brand name or the name of the designer behind?

30/06/11:Field work in Allerød, using the library.

01/07/11: Field work in Allerød, interacting with the sales persons, understanding how

they describe the products, and if they know something about the PLC.

04/07/11: Field work in Allerød, interacting with the design department, looking for information for the sales and the design process, how it happens, how it is carried on.

05/07/11: Discussion with Martin Kronenberg about: what theoretical framework is the starting point for my thesis? what methodology will I deploy to analyze which empirical setting? why is this relevant / innovative?

10/07/11- 10/8/11: transcriptions of the interviews, starting to elaborate about the coding, first round of coding; preparation of the study plan, starting to organise the field work material.

10/08/11: Presentation of the PhD plan: reflections on the scope of the project and what I wanted to investigate in the company, after having analysed the interviews with the first round of coding.
Presentation in the company of my PhD plan MANAGING DESIGN: THE ROLE OF DESIGNERS, VALUING AND ORGANIZING, AND SHAPING THE PRODUCT LIFE CYCLE The aim of my research is to understand the role and the influence of designers during the life cycle of a product, by creating a product that embodies certain values and able to enrol consumers into the networks. This leads to study the actors in the networks, their qualities and the values they create within their interaction. Investigating the role of designers and the product life cycle means to understand the participation of actors in the reconfiguration of existing agencies. This is a constructivist perspective that recognises the heterogeneity of potential actors, relations and networks, and potential designs are emergent, fragile and temporal. To understand such an idea, it is necessary to study how it makes a difference in organising activities, focusing on how a certain concept is mobilised and transformed and itself transforms what design is about in practice, and how it influences what is considered the processes and outcomes, i.e. the stabilised networks. In this way the aim is to open the black box of complex, fragile and shifting relationships between human and non-human actors. Some of the questions that could be analysed and taken into consideration related to the role of designers in the product life cycle are: What are the types of struggles, debates and breakdowns and connections that happen during the process and how are designers connected and related to the network? Which are the roles of designers in this process? What are the managerial challenges and how does management happen in these processes? What devices, actors, and relations are active to shape and co-create the life of an object? Verganti in his researches states that designers are language brokers, but actually he doesn't study how and which are the mechanisms for transforming and transporting knowledge. The premise is that I believe in the co-costructivistic perspective: knowledge is relational: it exists only in the relations, built on the interactions between different actors, dynamic, interactive and embedded in a network. It is constantly negotiated and co-constructed through the process of qualification and re-qualification of actors in the network, and the output of this negotiation is the knowledge construction. In my research I would like to analyse this topic, and try to capture the ways in which knowledge is transported, opening up the black box of processes and relations. What is the role of designers in transforming and translating knowledge within different actors? Considering the co-costructivistic perspective, knowledge is built on the interactions between the different actors in the network, and the output of this negotiation is the knowledge construction. The

network itself is not stable, but is dynamic. One of the aims is to develop an alternative way of understanding the life cycle (for lack of a better term) of products (Christiansen et al. 2010); the term cycle somehow indicates a linearity that may be useful for planners but is not helpful when trying to grasp the dynamics that could explain the ups and downs of a product over a long period. This might lead to define a better term and meaning. Valuing (Christiansen and Varnes, 2007, 2008, 2009) can be a way to overcome this difficulty. Valuing focuses the attention on the basic idea of value as generated by the relationships between customers and products, services, and brands and how these relationships are established, modified, and recreated over time. Thus, I will not look at how the product life cycle is managed, rather on how a certain concept is mobilised and transformed, and this approach is missing in the literature.

What are the relations and networks needed to make a certain design valuable and stable? What makes the network work?

Are there some patterns in how different processes and relations produces different design performances? E.g. are some management technologies or management styles performing better than others?

Product life cycle is a vey well-known tool in marketing. Levitt (1965) first introduced the concept of the PLC, presenting a tool to predict and to forecast marketing requirements and to assist in planning long-term product strategies (Wood, 1990). Despite critics (e.g., Dhalla and Yuspeh, 1976; Moon 2005; Wood, 1990), the PLC is used for corporate strategy, product development, and finance and production and is considered to be an influential concept (Golder and Tellis 2004; Moon, 2005) and a central and enduring framework in marketing (Golder and Tellis, 2004). The bell-shaped model hypothesises that sales follow a sequence of stages, beginning with the introduction and proceeding with growth, then maturity, and eventually decline (Polli and Cook, 1969). Kotler, Keller, and Cunningham (2006) propose that four things are asserted when stating that a product has a life cycle: (1) Products have a limited life; (2) product sales pass through distinct stages; (3) profit rises and falls at different stages; and (4) products require different marketing, financial, manufacturing, purchasing, and human resource strategies in each stage. Kotler et al. (2006) include different PLC curves and declare that the length is variable: a product often does not follow the classic product life cycle curve, but there are different curves for different kinds and typologies of products. Wood (1990) points out that the lack of data in most companies prevents the PLC from being usefully applied. Prior PLC research does not offer much detail on the processes and mechanisms that actually makes a certain product break the curve and rise to renewed fame again. The PLC concept is based on an assumption that the future can be predicted from past and present data into the future, assuming that presently identified networks are both relevant and stable in the future (Akrich, Callon, and Latour, 2002a, 2002b; Christiansen and Varnes, 2008). The research of Christiansen et al. (2010) finds an alternative way of understanding the life cycle of products, applying the concept to a dynamic perspective. The different movements and phases on the product life cycle might be understood from a position where value creation is described as a process of valuing: according to this perspective, value is generated by the relationships that products, services, and brands have to customers and how these are created, modified, and recreated over time.

- How is possible to create a timeless product?
- What happened and why the product life cycle has changed, going up and down?

The choice of exploring design as area of research is dictated by the strategic role that design has in innovation (Baldwin, and Clark 2004, Gemsera and Leenders, 2001, Veryzer, 2005,

Walsh, 1996), in new product development (Baldwin, and Clark, 2004), in achieving product differentiation (Candi and Saemundsson, 2008), in positioning in consumers' mind (Veryzer, 2005), and in providing a discipline in finding and solving problems in practical life through the creation of products that have intellectual integrity as well as aesthetic satisfaction (Simon, 1969 and Weick, 2004a, Veryzer, 1993). Design acquires a strategic importance for companies to survive, to improve the competitive position, to increase the innovation rate (Bruce and Bessant, 2002) and to sustain long-term growth and profitability (Kumar, Wellbrock, 2009, Candi, Saemundsson, 2008), to be differentiated in the marketplace (Candi, 2007), and to position the consumers' mind (Bauchanan, 2004). METHODOLOGY This study is aimed to understand how the continued value creation, reconstruction and reinterpretation of three products: Series7, PK 22, and Ice chair, departing from a well known management concept of product life cycle. To achieve this scope, I will try to open up the black box of processes and relationships that are sometimes reduced into the curves representing the relationship between profits or sales volumes and time as expressed in the PLC curves (Christiansen et al, 2010). The analysis would focus on the interactions, relationships, and networks between human and non-human actors (Latour, 1999), with special attention given to the qualification and re-qualification processes and the framing devices. The approach is in line with parts of the sociology of technology that considers technology to be a network effect, where all technology has to be understood in the context of the network of which it is a part. Instead of technology, I would use the concept of design. To quote Law (1992), such a view is concerned to show how "actors and organisations mobilise, juxtapose, and hold together the bits and pieces out of which they are composed". Thus I would not look at how well or bad the company has succeeded in selling the chairs, rather on the mechanisms that enable some products to create networks and successfully handle the interessement (Akrich, Callon, and Latour, 2002a; Callon, 1986a) with customers and other actors over long periods whereas other products are detached from their network (Callon, 1986b). The aim of this study is to understand both an historical and a contemporary phenomenon within its real-life context, using multiple sources of data. Interviews, document analysis (letters, memoranda, personal documents, calendars, notes, administrative documents, proposals, progress reports, and other internal records, news clipping and other articles appearing in the mass media or in the community newspapers, ect.).

The teaching form includes teacher and student-presentations, break-out sessions, intensive reading of texts and writing of a small project.

30/08/11: Course: Making the tacit explicit.

21/08/11-25/09/11: Going back to my desk: intense reading of the literature- reflecting on the memos I wrote during the summer and look for interesting literature on design management and for the writing of the philosophy of science.

26/09/11: Start intensive Danish course...everyone is speaking Danish in the company, so I need to intensify the understanding of the language.

29/08/11- 02/09/2011: PhD course in technologies of managing. The PhD course in management technology is required for PhD students enrolled in the PhD programme. Its purpose is to identify and analyse central issues in relation to management technology, which relate to managerial economics, supply chain management, performance management and innovation management. Useful for understand what the technologies of managing are, and

reflections for my project.

09/09/11: Meeting: design@cbs.

10/09/11: Presentation to John of the paper different streams of design for the conference in Hong Kong.

19/09/11: Submission of the paper to the conference in Hong Kong, about different streams in design, from which the literature review was departing from.

24/09/11: Reflections on the idea that I have started to develop from the interviews, talking with John: "In this company, Bessant's (2002) definition of design is reflected": how do we/you know it is reflected? What does that mean?

"Design is essentially the application of human creativity to a purpose, to crate the products, services, buildings, organizations and environments which people needs. It is systematic transformation of ideas into reality, and it is something which has been going since the earliest days of human ingenuity".

Thus, the intellectual activity is central. ...Is this not the case in all organisations and situations we study? Why is it relevant to mention here? - is intellectual seen as opposed to "practical" non intellectual activity? And does this have relevance within the ANT domain/theory? Does ATN differ between different types of activities - how do I do - ??

It is individual, but happens in a collective environment. –¿ does this makes sense in a ANT/network view?

The focus is on how a certain concept is mobilised and transformed and itself transforms what design is about in practice, and how it influences what is considered the processes and outcomes.

What is central in design is the brief.—-» How do you identify what is central in a ANT/network perspective? Is some things more central than others? How do we identify them?

29/09/11: Intense field work in the library of industrial design and in the industrial centre of design in Copenhagen, trying to understand what is design, what is industrial design, what is Danish Design.

30/09/11: Meeting with my supervisors; feedback on the writing and theoretical framework: As for the the analysis in the PhD workshop paper, I should try to always specify to myself and the reader what the theoretical framework is about: what is the core concepts, terms and points of analysis used in that framework? Then these concepts - and no others - should or could be used for the analysis - and in this way you move the analysis from being "everything" to a specific type of analysis. Otherwise you will confuse the reader and myself - and loose the focus. So if I think that "something is interesting" you should consider - does this fit with the theory I'm using here - and if yes - how does it make sense within the frame of interpretation I'm using? E.g. Latour talks about politics and power - but that is as part of the network analysis - not as part of personal/group or institutional resources like others do. As for the cases you should begin collecting the piles of data and paper into three piles - one for each furniture - and then maybe produce a checklist : do I have this information for this case e.g., sales volume, information of critical events over time, actors,

framing devices, qualities, changes and modifications of designs, networks, designers etc...

01/10/11: Reflections on the literature review: I think this one looks interesting - as it's a collection of published articles (don't know the quality of those). Delimitation of the perspectives: 1) Design and creativity 2) design driven innovation 3) Design and management - or management as design and 4) Framing and Design - or something like that....attempt to understand the co-word analysis and different methods in literature for writing the literature review.

03/10/11: field work; reflections with the workers in the sales department on: Management of design alliances: sustaining competitive advantage- Reflections on the book that I found in the bookshelves in the company and on the chat I had in the company. The book is about well designed products. The ability to nurture and protect the advantages created through design alliances is a major theme. Reflection of the books on value creation. Are they useful for the field?
Reflection with the managers of Fritz Hansen about the following points, that were collected from the material available in the company:

Design alliance, or design partnership, as it is used in the book, is a collaborative and interactive business relationship between company and its design resource. The parties to the alliance are mutually dependent in terms of inputs, o- production and rewards (but usually not in terms of ownership). The alliance can represent a knowledge- baed alliance of potential strategic importance, id this is recognised as valuable for the firm, and accordingly for the design consultant. The various design talents are considered in relation to the firm's particular business need in fact, the diverse sources of design expertise and multiple design tools make this a make challenge for firms that want to explore design in relation to their particular business problems

BUILDING UP ORGANISATIONAL CAPABILITIES IN DESIGN
How design based advantages are developed and sustained. From research on innovation and technology. It is necessary to innovate not just once, but continually. Moreover, business need to be able to commercialize the new designs to generate a profit for the firm as well as new benefits for the customers.

Sustain competitive advantage
A qualified design approach is closely related to human skills and talents in imaginative concept development and in converting ideas and concepts into material worlds of models, prototypes, areal products or other visual artefacts and services. Industrial designers often see themselves as problem solvers and creators.

Delineate a set of capabilities that may be useful for further knowledge development and practice. Although no quick fix exists in design management, knowing how to about it is essential for managers who want to benefit by working with designers.

Industrial design expertise is accepted to be a necessary, and potentially critical, resource in developing competitive products in more and more internationalized markets, as encapsulated by the term "winning by design" (Walsh et al. 1992). As seen from a business perspective, the company may want to control and govern design resources and relationships, as management is used to govern material resources. However, managing design resources is different, as the most critical design resources are embodied as human expertise, a combination of design related talents, skills and knowledge in a broad sense.

Difficulties in specifying the problem beforehand;

Difficulties in specifying the suitable work processes beforehand;
Difficulties in specifying the solutions criteria beforehand;

Partners need to work towards both suitable problem definitions (finding and formulating the problem in the briefing and task research like activities), suitable work process, and also finding and selecting perspectives or criteria to test and evaluate solution concepts and models.

The danish company B&O finding and dealing with the right designer talent is therefore regarded as crucial in product design. This statement means that material abilities of the designer are reviewed through his/her previous or current work (via portfolio presentations, pre-qualifications, efforts and design group competitions), indicating that visible presentation skills and the portfolio are seen as reflecting the expertise which can only be observed indirectly.

Only few firms seem to follow a conscious resourcing strategy in design areas. This may be due to not knowing the value of relating to design expertise more closely so as to transform design costs into a sustainable competitive advantage. However, it is worth noticing that particular designers may in fact follow a proactive resourcing strategy, since some designers actually are searching for, finding and selecting appropriate firms, that is, appropriate for their skills and long-term interests.

In order to sustain, and further develop, the ability to create leading- edge designs in products and communications, the ability to absorb or take in sustain the design competencies seems to be crucial, but it is often neglected.

The capability if create something new and valuable on the product or process level for the market is a crucial element of product design capability. At the product design level, this consists of problem finding, framing problems/ needs and developing solution concepts, as well as generating two- and three dimensional designs followed up with instructions and suggestions. At an organisational level, this includes design management abilities to stimulate, direct and nurture, follow up and facilitate direct communications with other areas. This activity is important for organising innovative efforts. This does not mean that innovative efforts are unsystematic or necessarily chaotic.

Development of the firm. New product designs, in particular the innovative and unconventional solutions, may lead to change on other areas as marketing and production

Following Nonaka and Takeuchi (1995): this process is akin to a dynamic knowledge-creation and knowledge conversation process. The parties seldom have ready- made definitions to negotiate in the process, although some initial criteria, such as technical or market-specs may be contained in the design brief. However, product designing is an evolutionary process with creation and refinement occurring through many iterative cycles. These cycles entail the exploration of needs and wants, as well as development and experimentation of preliminary ideas to prototypes.

04/10/11: Field work in the catalogue database of the museum of industrial design; looking for information about Fritz Hansen; inserted in the database.

05/10/11: Field work in the catalogue database of the museum of industrial design: looking for information about the serie7: inserted in the database.

06/10/11: Field work in the catalogue database of the museum of industrial design: looking for information about the Serie7.

07/10/11: Field work in the catalogue database of the museum of industrial design:looking for information about the PK22; I can´t find so many information on the PK22.

08/10/11: Field work in the catalogue database of the museum of industrial design: looking for information about Fritz Hansen; inserted in the database.

09/10/11: Field work in the catalogue database of the museum of industrial design: looking for information about Fritz Hansen; inserted in the database.

10/10/11: Redefinition of the research interest and intention of going abroad to look for data and sales number. In this period I am struggling a lot for finding information to draw the PLC. Re-presentation of the Plan in the company: The management of design processes and products can be interpreted in different ways, and the field is very fragmented. The point of view in my research is to understand design management as the outcome of negotiations and successful relationships between multiple actors. Management of design can be claimed to be a matter of management of the framing that guides the networks that produces the products and guide how it becomes part of a stable network. Prior researches (Simon, 1969; Faste, 2001; Rowe, 1987; Baldwin and Clark, 2004; Bojra De Mozota 2003; Ulrich 2007; Candi, 2007; Oakley, 1990; Verganti 2006, 2008, 2009; Utterback et al., 2006; Weick 2004; Boland and Collopy, 2004) have addressed the management of design in different ways but has mostly focused on the management of the design processes themselves and the related activities and by this has decoupled design processes and design management from the interpretation and relationships that construct the design, the product and its perceived value. The aim of my research is to understand the role and the influence of designers during the life cycle of a product (how designers participate, connect, relate and influence in the network construction) and how different actors relate in networks that produce the value construction (Christiansen et al., 2008; 2009, 2010). The scope is to identify the framing devices that are influencing the life cycle. To address to my research question, I have chosen to be deeply rooted in the industrial field, and to study three design products produced by the Danish Company Fritz Hansen. I would analyse the power and possibilities of the concept of furniture products that has been subject to multiple framing processes over a period of more than 50 years. I will look at the actors in the networks, their qualities and the values that they create within their interaction, to understand the participation of actors in the reconfiguration of existing agencies and needs (Akrich et al., 2002, and Callon et al., 2002). This is a constructivist perspective that recognises the heterogeneity of potential actors, relation networks, and the designs, which are emergent, fragile and temporal. The understanding of how qualities of products are constructed through the interessement of human- and non-human actors within frames (Akrich et al., 2002a and Callon et al., 2002), provides some interesting opportunities for the company to understand how management of design is not only about managing the design processes, but also exploring how different actors ascribe value to a certain product, and how the valuing process can be managed through framing. This would contribute to get a better understanding of the role of design, designers and how companies can manage design (in it's multiple meanings) to improve sales over longer time.

11/10/11: Field work in the catalogue database of the museum of industrial design:looking for information about the PK22; I can´t find so many information on the PK22; serie7; Danish Design; Arne Jacobsen; Fritz Hansen; American Design; Eames; Saarinen; Moma (since

in a book I found that Jacobsen was inspired by them)

12/10/11: 11/10/11: Field work in the catalogue database of the museum of industrial design:looking for information about the PK22; I can´t find so many information on the PK22; serie7; Danish Design; Arne Jacobsen; Fritz Hansen; American Design; Eames; Saarinen; MoMA (since in a book I found that Jacobsen was inspired by them); interest in going back to Fritz Hansen to collect more information, and get access to the intranet since I could not find the sales data. I had one of the first negative answers:

Dear Marta,

It will not be necessary for you to have access to our intranet for the purpose of your project. You are welcome to come to Allerød during next week in order to get some books etc. I was under the impression that you had already talked to Louise Brandstrup Zastrow about the campaigns and that you had already received the documentation we have on this. However, if you could specify what you need, Louise would be glad to check whether this documentation is available. Please drop Louise a mail telling her when you will come to Allerød

.

First obstacles in the the research. I asked help to my supervisors; John answered: Seems a little more difficult - maybe at better strategy is to try to collect what you have on the 3 product in a type of case presentations and then have a meeting with them?
Plus, I have data from 2001. before they don't have any record because they have changed the ERP system. So, they are quite useless....i don't know where in Denmark I can find archives of balance sheets or sales figures. Maybe I would wait for Claus coming back, he said he has some contacts with the Jacobsen's nephew and PK's relatives..
Decision to stop to go to Danish class and necessity of going back to the company
13/10/11: approach to evaluate the concept of valuing, the social culture of product, history of modern design, the aesthetic of the objects.
Decision of contacting Tobias Jacobsen:
Dear Tobias Jacobsen,

I am writing to you in order to ask for your collaboration for my Ph.D project that could also turn of to be very interesting for you.

I am a Ph.D. student at CBS, Department of Operations Management. I am studying design management as the outcome of negotiations and successful relationships between multiple actors.
The aim of my research is to understand the role and the influence of designers during the life cycle of a product (how designers participate, connect, relate and influence in the network construction) and how different actors relate in networks that produce the value construction. The scope is to identify the framing devices that are influencing the life cycle.
I am collaborating with Fritz Hansen and other researchers from CBS (Professor John K. Christiansen and associate professor Claus Varnes). Fritz Hansen is providing data for the project and has helped we in different ways.
In particular, I am studying three different products, Serie7, PK 22 and Ice Chair and my hope is to develop and understanding of the role of design and designers, and maybe come up with a theoretical model that can help companies to improve the use of design in their

products and how they can manage their products better.
To understand the development of sales over time I am trying to re-construct the sales figures, and and hope that you could help me with these? Specifically I would like to know how the royalties for serie7 that has been over the years since the introduction on the market.
You are very welcome to contact me or my supervisor (in cc in the mail) for more information on the project or call me on my mobile phone 22 90 46 78.
Unfortunately, the answer is negative:
I can not help you with this...I do not have any knowledge about that.
Sorry about that Tobias

The theoretical base of the project: The understanding of how qualities of products are constructed through the interessement of human- and non-human actors within frames (Akrich et al., 2002a and Callon et al., 2002), provides some interesting opportunities for the company to understand how management of design is not only about managing the design processes, but also exploring how different actors ascribe value to a certain product, and how the valuing process can be managed through framing. This would contribute to create a new interpretation and a different managerial tool for keeping up the sales.

Contact the former design manager, he gave me a positive answer and we agreed on an interview.

Decision of contacting the Kjærholm family, announcing that I would come back in the field:
I am coming back to work on the project, after a busy period with the Ph.D courses. I would like to know how I could contact the Kjærholm family in order to ask them if they have records for the royalties during the years. Thank you very much for your collaboration.

But:
Dear Marta,
I am sorry, but we cannot allow you to contact the Kjærholm family. If you need some information about the royalties please talk to our Executive Vice President Finance & IT next time you are at Fritz Hansen.

But at least the secretary could give me some material next time that I was intended to go there.

14/10/11- 24/10/11: Working on the literature review and on the article for the conference.

24/10/11: Interview to the former Design manager.

25/10/11-26/10/11: Transcription of the interview.

27/10/11: Mail from John announcing that the managers have lost interest in the PhD project.. . . ; I understood that the managers said i am not working I really can't understand what they were expecting from me. maria was super polite, everyone was super nice during the interviews, but then they were just on their own. except sitting and reading my book i didn't have anything really to do. And 1h30 to go, 1.30 to come back just to look at internet

is very tiring. Kasper Salto (not working there) was the most open one, in the future when he is less stressed with us competition (he is going to complete it by december) i might go to his studio and observing him and the colleague working. So John´s plan was to go to the company with a plan and present it to the manager

29/10/11: Decision to get an insight also on the customers, speaking with users and recording: Primary sources are things like letters, diaries, or newspaper accounts. Secondary sources include other biographies, reference books, or histories that provide information about the subject of the biography.

What makes this person special or interesting?
What kind of effect did he or she have on the world? other people?
What are the adjectives you would most use to describe the person?
What examples from their life illustrate those qualities?
What events shaped or changed this person's life?
Did he or she overcome obstacles? Take risks? Get lucky?
Would the world be better or worse if this person hadn't lived? How and why?
Exploration of that person's inner world (cafes, homes, favourite things)
Learn all about a person's life (personal, professional, private)
Select one aspect of that person's life (or one time period)
Focus all your research on that component
Try to select an aspect of that person's life that has not yet been told pictures;
photos

30/10/11: APD course- technologies of managing

31/10/11: Transcription of the interview with the former design manager

02/11/11: Follow up meeting in the company: presentation of the difficulties, information achieved, where I think I am in the research process, plan for the next 6 months, and plan for the next steer committee meeting.

03/11/11: Field work: information about Arne Jacobsen; Pk22; videos; review of the videos online about Arne Jacobsen.
04/11/11: Abstract for the conference submitted- reflection on

07/11/11: Field work in Fritz Hansen, visiting the museum and the production facilities in Allerød.

08/11/11: APD course on writing up

09/11/11- 13/11/11: Preparation for the course: interviewing.

14/11/11- 18/11/11: DOME PhD course: "Interviewing: How to Plan for, Execute and Analyse Series of Research Interviews", 14-18 November 2011, Aarhus University.

21/11/11: start to code in Dedoose the interviews, according to what I have been learning in the course.

22/11/11: Learn how to use Dedoose.

23/11/11: Coding: trials, I am doing that by following the different approaches suggested by Saldana.

24/11/11: Coding: trials.

25/11/11: Coding: trials.

26/11/11: Coding: trials.

27/11/11: Coding: trials.

28/11/11: Coding: trials; development of a short paper prepare something on management of design (review of research) and a "theoretical framework" that outlines the theory(ies) and models/elements
about for the analysis.

29/11/11: Coding: trials.

30/11/11: Coding: trials.

01/12/11: Coding: trials.

02/12/11: Coding: trials.

03/12/11: Coding: trials.

04/12/11: Coding: trials.

05/12/11: Writing up from the analysis.

06/12/11: Writing up from the analysis; reflections on That could be done with some simple "coding" in a text document - or be simply trying to map the processes and actors on a large piece of paper. Not use some advanced computer program when you are not clear about what and why you need it. Try to establish the outline of the "birth" of these 3 products.

07/12/11: Meeting with Claus on the plan.

08/12/11: Discussion with Claus on the plan to propose to Fritz Hansen; preparation of the network of the actors involved and of the qualities of the design- drawing of the map derived from the first round of coding.

09/12/11: Meeting in Fritz Hansen with the steering committee to realign the goals. Document presented: from the launch phase, until these days, there are some characteristics that make the Serie7, Pk22 and ice chair very similar in their differences. There are two

main commonalities: they are part of the Scandinavian design tradition, and they follow similar patterns in their life cycle, with wavy movements, having experienced rises and falls in the sales. For understanding this point, actor network theory will be used to explain what happened when the sales have increased or decreased, and which are the framing devices that have made possible that. In order to embrace this methodology, Latour suggestions are taken into consideration. He encourages overcoming the traditional opposition between internal and external analysis, and the traditional attitude to analyse relativistic value that is part of the piece. In order to prevail over this traditional opposition between artistic values and content for the relativist sociologists, and the necessity to define the social values attached or intrinsic to the product, it is necessary to study the qualities by using the sociology of mediation: following the most important events in the history of the object, its mobilisation, and the processes that connect its creation to its life, evaluating the qualities and how they are changing over the time. So the study would be about the actors that have contributed to the formation of the networks, their stabilisation, their changes and the framing devices. Design is a visual language, a set of symbols, signs and icons (Verganti, 2009), and it is evident that these chairs are embedded in the Scandinavian tradition. Scandinavia is characterised by long winters and few hours of light, designers tend to create light, practical, and dazzling domestic environments. The design has always been considered high quality and some of the products have acquired the status of timeliness. The three objects analysed lay in a tension, caused by the fact they have been through different historical evolutions of industrial design perception, changes of the needs of the society and the evolution in cultural consumption. These objects are convening many qualities and different meanings that are influencing what people think and desire about their living in their homes and spaces. But they have been created to making everyday life better and more beautiful. Design can be inserted in the discussion of Veblen: "the theory of the leisure class". The design is part of the concept of luxury goods, considered not necessary, they are not purchased because they are essentials, but because they show a certain status symbol. Design is luxury, is sustainability, is considered waste, but at the same time it is a way to distinguish. It is the achievement after having reached the survival status: the design goods becomes desired, they are looked as a mean to be inserted in particular elitarian classes and to distinguish from the others. During the years, the concept of luxury good and the perception of them have been modified. Design's perception, as part of the universe of the of Veblen goods, has changed during the years, entering nowadays in a dichotomist relation within the society: luxury goods are attractive, but modern society try to impose, especially in Nordic countries, a model of egalitarianism and democracy, where cultural and luxury consumptions are private and intimate, becoming in certain way iconoclastic. This is an aspect to consider during the analysis of the qualities of design in modern societies, even though it has two sides: on the one hand it is economic sector, which has a crucial relevance in the western societies, on the other hand, it has to be discrete and being simple. The chairs in Fritz Hansen have evolved certainly their qualities during the years, from being a high quality products to a luxury design, many of the qualities attached to them have been constantly changed and re-shaped according to the different times, to particular events both historical and artistic, their advertisement or presentation to the press. They are part of the Scandinavian tradition, made famous because of its capability to influence the style, on the capability of maintaining high craft standards by addressing to both a relatively small and international market. Arne Jacobsen, Poul Kjærholm and Kasper Salto have like point of departure the fact that they are all cabinetmakers, making them particularly attentive to the details and the overall impression. Design is a visual language, it uses shapes and colours to recall masculinity,

femininity, emotions, forms to guide the users to the functions of the objects, and it involves all the senses. "Design has a twofold relation, having in the first place, a strict reference to utility in things designed; and, secondarily, to the beautifying or ornamenting that utility. The word design, however, with the many has become identified rather with its secondary than with its whole signification- with ornament, as apart from, and often even as opposed to, utility. From thus confounding that which is in itself but an addition, with that which is essential, has arisen many of those grant errors in taste which are observable in the work of modern designers" (Heskett, 1980,p.20). Designers, in their life, wish to become famous with two objects: lamps and chairs. They both need technology and invention, technical competences and artistic ambition (Sudjic, 2008). These two objects are archetypes and designers dream to modify them to create a new one. These objects define the way people use the rooms, the environment, and the houses. They shape and influence the way people use the interiors, the way they eat, sit, and the way to look at each other.

Design management process. Methodology with ANT. In my research, I am analysing four different products design: egg chair, serie7, pk22, ice chair. This will be a case study using ANT theories and co-costructivism perspective. "In a postmodern area, truth is constituted through a dialogue... among the members of a community" (Kvale and Brinkmann, 2009, p. 247). ANT is a useful methodological framework to study the mechanisms that enable some products to create networks and successfully handle the interessement (Akrich, Callon, and Latour, 2002a; Callon, 1986a) with customers and other actors over long periods (Callon, 1986b). The analysis in my study will be based on a theoretical framework that focuses not on narratives but on relationships: the human and non-human actors and their relationships, their actions to enrol and interess in the network, how it is made stable, and the struggles as the process unfolds. Interessement is the process of successfully getting others to support, interact, and devote their energy and resources toward something (Callon, 1986b). In the literature, innovation processes can be seen as a mishmash of decisions that cannot wait (Akrich et al., 2002a), in an environment of complex, changing markets, and customer tastes, in which action cannot be planned or predicted in any mechanical way (hence the term nonlinear), facing many different trials (tests) and accusations, and in which there are claims for an innovation (i.e., a certain product) that it is better than prior solutions. I would apply this perspective also in design processes, not only innovation processes. The interessement process is driven by spokespersons (Akrich, Callon, and Latour, 2002) that speak on behalf of and for the innovation, thereby trying to create a stable network of human and non-human actors (Latour, 2005) that become allies across social, organisational, and technical domains: "The model of interessement sets out all of the actors who seize the object or turn away from it and it highlights the points of articulation between the object and the more or less organised interests which it gives rise to" (Akrich et al., 2002a, p. 205). Analysing and writing within the framework of actor-network theory (ANT) requires one to follow the actors and their relationships (Latour, 2005). The design products exist only when they are acting or acted upon: networks are performative and by nature temporary, constantly created and recreated in the ANT view. My research will be exploratory (Drenth, Thierry, and Wolff, 1998, p. 15; Kotler, Adam, et al., 2006, p. 122), because the purpose is to understand a complex phenomenon. Deep and new knowledge is often generated by in-depth analysis of current phenomena in their social context (Flyvbjerg, 2001). The study will analyse the continued value construction and reconstruction within the network, departing from a well-known theory, the product life cycle. The aim is to discover which qualities, framing devices and qualification and re-qualification processes that can explain how a product, in this case a design product, can become timeless, and

which managerial tools is possible to apply when the sales are decreasing. The hope is to be "sufficiently theoretical sensitive, so . . . [I] could conceptualise and formulate a theory as is emerges from the data" (Glaser and Strauss, 1999). This leads me to pay particular attention to the four elements in an engaged scholarship: research design, theory building, problem formulation, and analysis (Van de Ven, 2007). The approach should be flexible enough to allow me to adjust the protocol and the study, to focus on investigating which elements and attributes that could explain changes in the value objects (assuming that it is happening because of ANT approach) to analyse the processes, events, and activities that could explain how a product gets a second life and becomes timeless. The objective of this study is to open this black box of complicated processes and relationships that are most of the time reduced and simplified their complexity into the curves representing the relationship between profits (or sales volumes) and time. The dynamics and phases of products as the result of fads, fashion, or styles the interactions, relationships, and networks between human and non-human actors (Latour, 1999), are lost within a simple PLC representation. To increase the present study's theoretical sensitivity (Glaser and Strauss, 1999) and to inform the data collection, I am starting to prepare the literature review on design processes and product life cycle. I have already started the interview process. I am planning to have three or four round of interviews. The first interviews are ended and were aimed to provide the background information on the company, products, strategies, and history and design processes. I should admit that I have committed some mistakes, that from now on I won't repeat (hopefully). During the interview I was taking a lot of notes, loosing the eye contact with the interviewees. I lost, in this way, partially, the body language and meaning of pauses (I was thinking they were giving me time to write down part of the answer). I did not listen to or transcribed the interviews before doing the next one, so I could not adjust the protocol. Furthermore, none of the interviews were mailed to respondents for validation. I am planning to run the second round of interviews focusing on the origins of the products and its history, involving employees from the manufacturer, design and marketing experts, and architects hoping they can provide valuable information. The third should involve users, consumers, and I might use cards or the tree presented by Ruth to understand the perception of the products, how they interpret it and which meanings they attach. The fourth should comprise follow-up questions to validate specific data. Since I am conducting a case study, I am aware of the fact I should start to collect and classify also information from internal and external sources such as annual reports, financial statements, advertising and marketing, Internet sources, and announcements and articles in books, newspapers, and magazines. Case studies should satisfy the criteria of validity and reliability. The validity, especially when based on interview data and case studies, is considered by many researchers as constituted through dialogue: "valid knowledge claims emerge as conflicting interpretations and actions possibilities are discussed and negotiated" (Kvale and Brinkmann, 2009, p. 247). The interviews, the empirical observations and incidents should start to be coded, as soon as I can understand how to code within ANT framework. The reliability of the study was supported as suggested by Yin (2009, p. 45): using a case study protocol and developing a case study database. I am planning to keep more updated the case study protocol. Right now, since I was not very aware of its importance, it is only a hand-written diary of my perceptions on the field. But I am planning to make it a project diary where I can note the interactions in the field, fully transcribed interviews and observations made during the interviews, the meaning of pauses, the echo, the body language, if something unexpected comes out and why I might lead the conversation to a certain direction.

12/12/11: Field work in Fritz Hansen- understanding the work of Arne Jacobsen, reading the papers and the books on AJ available in the company, listening to the narratives of the persons.

13/12/11: Field work in Fritz Hansen- Decision: eliminate the Pk22 and go back to the Egg, there are too many information missed.

14/12/11: Field work in Fritz Hansen-access to the minutes from the meetings

15/12/11: Field work in Fritz Hansen- Claus came with me and we spoke with the secretary, explaining what we needed.

	Serie7	Pk22	Ice	FH
Kataloger eller brochurer	Enkelte ældre kataloger er scannet ved Svens mellemkomst men vi mangler det år hvori de er publiceret	En enkelt bog ("Essential on Poul Khærholm")	Seks komplette FH kataloger men vi mangler årene	Seks komplette FH kataloger men vi mangler årene
Historisk presse omtale	Mangler	Lidt – kun på tysk.	Er set på DR.	Mangler
Udstillinger, messer	Mangler	Mangler	Mangler	Findes en oversigt?
Kendte personer som spurgt om de må købe?	Mangler	Mangler	Mangler	Findes en oversigt?
Salgsdata	2001-2011	Mangler data 1957-2000 and 2001-2011	Mangler data 1957-2000 and 2001-2011 (Komplet)	Nok den sværeste opgave
Reklamer/ annoncer	Mangler historisk	Materiale fx om AIDS-kampagnen	Mangler historisk materiale	Findes en oversigt
Særlige reklametiltag fx miniature	Mangler	Mangler	Mangler	Findes
Produktmodifikationer især farver og materialer	Mangler	Mangler	Mangler	Findes oversight

Table B.1. Overblik over status på information Forskningsprojekt: FRAMING 15. December 2011.

16/12/11: Field work in Fritz Hansen- Claus came with me to discuss with the secretary about the data we are looking for. The secretary brought us in the basement and in the museum, where all the journal newspaper were collected and stored. We also look at the financial statements and see if there are interesting information on the sales.

19/12/11: Field work in Fritz Hansen, going throughout the minutes of the meetings and the financial statements.

20/12/11: Field work in Fritz Hansen: going throughout the minutes of the meetings and the financial statements.

04/01/12: back to my desk.. reflect on how to collect data in a more efficient way, read ethnographic literature, case studies, prepare databases that can be efficient, organisation of the interviews.

05/01/12: Going to Fritz Hansen with John to look for documents.

06/01/12: Fritz Hansen: reading the minutes from the meetings.

09/01/12: Fritz Hansen: transcribing the minutes from the meetings.

10/01/12: Day at the desk to reflect on the field notes collected, look at the literature, writing memos.

11/01/12: Interview with Claus and the former designer in Fritz Hansen, considered the gate- keeper of the company.

12/01/12: Reflections in the field on how to find the traces left by the actors, how to look for the qualities they have been described; interaction with the persons in the museum.

13/01/12: Interaction with the sales and marketing department, understanding what they think it is considered important.

16/01/12: Field work with John in the company, reflections on ANT and semiotic; SEMIOTICA DEL DESIGN- semiotics of design, Barthes.

18/01/12: Museum of industrial design: information

19/01/12: Quick presentation to the steering committee on how I am proceeding.

20/01/12: Field work with Claus in the company; finally we received some years with the production number.

21/01/12: Preparing for the EDEN seminar.

22/01/12: Preparing for the EDEN seminar.

23/01/12: Preparing for the EDEN seminar.

24/01/12: Preparing for the EDEN seminar.

25/01/12: Preparing for the EDEN seminar.

26/01/12: The secretary in Fritz Hansen found sales data from man 1993 to 2001.

27/01/12: Preparing for the EDEN seminar.

28/01/12: Preparing for the EDEN seminar.

29/01/12: Preparing for the EDEN seminar.

30/01/12: Fieldwork; reflections with talking with the persons in the company: Going through different text-books and articles on design and management of design has made it possible to for us to identify a number of different views - or perspectives - on what design management is about. In the past different views on the management of design has been presented. These each seems to be rooted in different views on what design should be concerned with, is considered to be and what the aim of design is or should be. International Council of Societies of Industrial Design defines design as "a creative activity whose aim is to establish the multi-faceted qualities of objects, processes, services and their systems in whole life cycles. Therefore, design is the central factor of innovative humanisation of technologies and the crucial factor of cultural and economic exchange." We will discuss three established views on design and their associated views on what management of design should be concerned with: Design as planned action to improve products and services; design as concerned with presenting new meanings and that design is a fundamental activity in human life. Additionally, we will present a newer view on design processes as an outcome from networks produced within frames. The different views on design and management of design are presented in table one below. After the discussion of these different perspectives we will demonstrate how the concept of networks and framing can help to understand management of design in a new perspective, by showing how we have applied it in a study of a classical Danish design furniture over a period of more than 50 years. Lastly we present some conclusions and implications for management.

31/01/12: Literature review research.

01/02/12: Literature review research.

02/02/12: Preparing for the EDEN seminar.

03/02/12: Preparing for the EDEN seminar.

04/02/12: Preparing for the EDEN seminar.

06/02/12-10/02/12: Eden doctoral seminar in methodology for operations management.

12/02/12: Reflection from the course, before going back in the field.
What makes the products timeless? Which are the framing devices that influence the product life cycle? Which are the features to make the product timeless? Which are the features of the products that make it timeless or features that breaks the iron cage of the product life cycle.

How can designers make a timeless product? How can the product resist for many years? Give a different interpretation of the meaning of product life cycle using the theory of value creation: it is not a linear process, but it is a dynamic and interactive process. What does it mean? Methodology:
First: exploratory study, he results of exploratory research are not usually useful for decision-making by themselves, but they can provide significant insight into a given situation. Although the results of qualitative research can give some indication as to the "why", "how"

and ”when” something occurs, it cannot tell us ”how often” or ”how many”.
Case study research, using:
- ANT
- ethnography as tool
- look for “stories”, myths and symbols and urge researchers
- culture
- emotions
Locke and golden biddle:
-previous work and interxtual fields accomplish this through three textual acts.
1. Formulating overaching ideas that articulate and constitute the research areas
2. Constructing congruent relationships among different research domains to create common ground
3. Reinterpreting previous work to show underlying consensus about the configurated investigative ground
- verganti
- Ant

engaged scholarship mode:
- research design
- theory building
- problem formulation
- analysis
study the network of human and non human actors how they have handled the interessement process which are the mediators?

13/02/12- 21/02/12: work on the papers

22/02/12: Reflection on the notes, diary and theory development, coding system

23/02/12: Steering committee meeting; data on revised sales figures 2009 - 2011 for the 07 chair.

The figures you received earlier were orders and not sales plus the figures were for all AJ Stacking chairs.

The difference between my earlier figures for 2010 and the ones in this sheet is item number 3177 The Children 07 Chair which was included in my earlier statement. But I can understand from Lars Torp Madsen, that this new chair should not be included.

24/02/12: We had an interesting day yesterday because they gave us all formal material from the board meetings.

It feels as we have advanced in trust.

It will require 2 days at least just to read these books thoroughly. But 3107 is very rarely mentioned. They were extremely production focused in the years until the family left the company in 1978-79.
27/02/12: lecture on innovation

28/02/12: Field work in Fritz Hansen

29/02/12: Literature review- reflection on the research question

01/03/12: Literature review- reflection on the research question

02/03/12: reflections on the IPs and licenses

03/03/12: reflections on methodology: This research looks for an alternative way of under- standing the life cycle (for lack of a better term) of products; the term cycle somehow indicates a linearity that may be useful for planners but is not helpful when trying to grasp the dynamics that could explain the ups and downs of a product over a long period, focusing the attention on the basic idea of value as generated by the relationships between customers and products, services, and brands and how these relationships are established, modified, and recreated over time. Especially, making it almost eternal. I would like to develop an new way to look at the product life cycle in design. I would like to increase the knowledge on how differently manage design products. From a theoretical point of view, my hope is to contribute in the design/ innovation management field by using ANT, understanding the role of designers in this process. "In fact history does not belong to us; but we belong to it. Long before we understand ourselves through the process of self-examination, we understand ourselves in a self-evident way in the family, society and state in which we live. The focus of subjectivity is a distorting mirror. The self-awareness of the individual is only a flickering in the closed circuits of historical life. That is why the prejudices (prejudgments) of the individual, far more than his judgments, constitute the historical reality of his being" (Gadamer 1989: 276-7, tr.)

04/03/12- 21/03/12: starting the writing up of the seminar for the first working in progress seminar and start to re- organise the data; start to use Sente for the Literature management in a more systematic way; doing literature review; refining the research question.

20/03/12: Joining the project business design: opportunity: improve the literature review.

22/03/12: Field work in Fritz Hansen, conversation with the CFO.

23/03/12- 29/03/12: Working on the paper.

30/03/12: Meeting with john to discuss the improvements for my first work in progress.

10/04/12: Feedbacks from the library on the profit/ turnover of Fritz Hansen in the past years, done by certified accountants.

11/04/12- 22/04/12: Working on the writing up of the analysis.

23/04/12: Steering committee meeting.

25/04/12: New data with the sales numbers.

26/04/12- 06/05/12: Interaction with design-lovers, professors interested in design; architects that are interested in design.

08/05/12- 12/05/12 Barcelona for meeting the persons working on Euro-design.

20/05/12: The famous design: Eames and the India report; the library of the design museum.

21/05/12: 1 WIP; defendant: Aseem K.; feedback: looking at valuing the unique, sociology of imagination, reflect on how the literature review is influencing the discussion, how it is influencing the analysis, how i am going to bring them into the conclusions.

22/05/12: Field work in Fritz Hansen: looking at the historical documents and old brochures.

23/05/12: Looking into the data- reflection on the coding system and how I should improve it.

01/06/12: Starting to get interested in Steve Woolgar and in the STS framework.

06/06/12: Look for books in design management visualisation of the 3 of the books you mention, they are marked "Allerød" and you can pick them up at my desk.

14/06/12- 20/06/ 2012: Conference in Manchester: Doctoral colloquium and conference-paper presentation.
Reflections on:
design to create meaning,
design to create sustainable thinking,
how two relate to meaning and customers,
look for papers in:
journal of marketing,
journal of marketing research,
journal of consumer behaviour.

In order to challenge consensus with my thesis, since I am basing on a different philosophical foundation.

17/06/12: field work in Fritz Hansen, minutes from the meetings reading Information from Peter about the revenues and the profits in Fritz Hansen.

18/06/12 Working on the paper from the conference- on the feedbacks received and on the improvement of the theoretical lenses

19/06/12- 18/07/12: working on the data, on the analysis, writing memos and trying to related to the ANT theory.

04/07/2012-06/07/2012: Fieldwork in Fritz Hansen, collecting material from the basement and chatting with the sale department persons.

07/07/2012- 18/07/2012 working in the literature review and on the memos of the collected material.

19/07/12: Interview to Catalani, expert in scandinavian design in Bocconi.

20/07/12: Interview with Francalancia, professor in design and architecture, IUAV university.

23/07/12: Interview with Guido Guerzoni, Associate Professor in history of economics and consumption, Bocconi.

24/07/12: Interview with Baia Curioni, Associate professor in Bocconi, expert in consumption of art and design.

30/07/12: Interview with Stefania Borgini, expert on management of design, Bocconi University.

31/07/12- 24/08/12: Working on the transcriptions, on writing the memos and relating to the cases.

14/09/12: Field work in Fritz Hansen- looking at the financial reports from 1955 to 1985.

21/09/12: Field work in Fritz Hansen; looking at the financial reports from 1955 to 1985.

28/09/12: Field work in Fritz Hansen; looking at the financial reports from 1955 to 1985.

29/09/12: Start to interact with the customers and the users, asking what they think about the chairs, why they have bought it.

01/10/12: PP presentation covering our mission, ambition and values. Furthermore company presentation "Making Statements" where you can find some information about our history. This is described in detail on our website as well.

The GUF's you can look through (and make copies of if needed) on Friday when in Allerød.

I have asked Lars for relevant finance reports etc. but he tells me that there is no further material besides the annual accounts which you have already been looking through and the material you have received so far, so I hope you can manage with this. If you have some questions related to the financial part.

03/10/12: Application for studying abroad: Oxford; process started: Design is considered a fundamental factor for competitive success across a wide range of products (Rothwell, 1994, De Mozota, 2003). Presentation in the company of how I intend to continue the research in Oxford (announcing that I am going to be abroad) In 2005, Heskett opened his book on design asserting: "one of the most curious features of modern world is the manner in which design has been widely transformed into something banal and inconsequential. In contrast, I want to argue that, if considered seriously and used responsibly, design should be the crucial anvil on which the human environment, in all its details, is shaped and

constructed for the betterment and delight of all" (Heskett, 2005). My scope is to investigate how an alternative view on the management of design can help companies to manage design intensive products, and what are the implications for their design and management activities. My research is a field- based research, aimed at understanding how a particular design emerges among others, starting from the ontological and epistemological belief that the design is an effect of a network, and reality is co- constructed. The Actor- Network Theory is used as ethnomethodology, to reflect on the factors, the elements of the relations and of the situations that produce a classic design across time and space. Some design concepts are black-boxed to understand the effects, the relations, negotiations, troubles, conflicts, etc., that produces a certain "design" image - and how these transform, mutate, evolve, are acted upon and acts itself over time. In particular, my case study is carried out in Fritz Hansen and though the analysis of some chairs and lounge chairs that have been in the market for more that 60 years, I intend to investigate what is a classical, how a classical design is framed, how value is created in design products. A chapter of the thesis is aimed at describing how managers manage design processes, using specific technologies of management, such as design brief, business models, business plans. I will reflect on them using STS, by challenging accepted views about these managerial tools and observing the impact on the organisation, management and design processes. The possibility of having a course with Professor Woolgar will definitely increase the quality of the research and my theoretical foundation. More over, through the analysis of historical items and new products that have been recently launched in the market, I intend to understand how design as a process is managed and which are the technologies of management that abbreviate the distance between the object and the management. What holds a design object - what are the forces, connections and alliances that produce - and alter - the design and its relations to the wider networks? How the framing is involved in multiple and different actors, how can create value? How is it possible that some furniture could become a classic, considering the dynamics and phases/stages of products as the result of fads, fashion, or styles of the interactions, relationships, and networks between human and non-human actors (Latour, 1999)? The elegance, the beauty, or the way a design product, in particular a chair, is considered to be entangled with the construction of the qualities by the actor-network. Some questions then arise: what is actually considered good or beautiful design? What makes a design object to affirm itself as valuable, classic, timeless or alluring? How do manager then manage the processes to achieve this? These are the questions I intend to answer in my research project. Currently, I am working on a literature review of different approaches to design management, developing mostly on an "historical" approach, how it has evolved in the different schools, focusing on the design processes, the related activities to achieve an understanding of the interpretations and the relationships of what construct the design of the products and their perceived value. I am also conducting an extensive study on ANT and STS to strength my methodology.

05/10/12: Field study in Allerød: documenting with pictures the diary of the company, and the collection of material from the newspapers; relate that to the minutes from the meetings that I have already collected.

08/10/12: Field study in Allerød looking at the financial reports from 1955 to 1985.

11/10/12: Field study in Allerød: documenting with pictures the diary of the company, and the collection of material from the newspapers; relate that to the minutes from

the meetings that I have already collected.

13/10/12: Teaching design management at the academy Danish Centre for Design Research; based on the literature review.

16/10/12: Field research looking for: I would like to talk with someone about these two topics:
- design management: new product development and maintenance of existing products
- performance management:
- business models/ business plans;
- balanced scorecards;
- IP strategy;
- customers segmentation;

Could you please arrange a meeting about these issues? i think it can take 1 hour per topic.

This week I´ ll be in FH thursday and friday, from next week any day is fine with me for having a chat about this topics, except Thursday, since i am teaching.

20/10/12: Field study in Allerød: documenting with pictures the diary of the company, and the collection of material from the newspapers; relate that to the minutes from the meetings that I have already collected

23/10/12: Interview with the CFO and head of design
Interview with the head of the design department.
Aim of the interview: understanding the managerial processes and the technologies of management present in the firm so I can develop the chapter in Oxford.
- customers
- NPD
- quick presentation of the results of the research
- I would like to understand how a design company, and in particular FH, is managed and how the role of the designers

How is it managed the NPD phase?
Where ideas come from?
Can you draw the sequences of the NPD?
Which are the criteria of designing new product?
Do you think it has changed over the years?
How do you define a classic?
How do you manage the classics? Is it a separate line?
What are you doing for the classics for keep up the sales?
How do communicate the knowledge on the classic?
How do you think value is created in the company?
Which are the financial tools on which you rely on?
And the performance measurement system?
Do you think it has changed over the years?
Do you think the performance measurement system influences the design process?

27/10/12: Field study in Allerød: documenting with pictures the diary of the company, and the collection of material from the newspapers; relate that to the minutes from

the meetings that I have already collected.

29/10/12: Workshop: making things valuable, reflections on the work of Karpik and the valuing of rare and precious things, work of art and cultural goods.

02/11/12: Visit in Fritz Hansen- classifying the warehouse.

09/11/12: visit in the Lillerød.

14/11/12: Working in the literature.

16/11/12: Visit in Fritz Hansen- warehouse exploration.

23/11/12: Visit in Fritz Hansen- basement exploration.

27/11/12: Nvivo course.

29/11/12: Meeting with the librarian to find information about how to look for design information about the designers.

30/11/12: Field work in Fritz Hansen, exploring the warehouse and the documents collected from the newspapers.

03/12/12: Visit the Frederiksberg Library, for finding information on Arne Jacobsen and his buildings; access also to Politiken.

04/12/12 : Visit the Frederiksberg Library, for finding information on Arne Jacobsen and his buildings; access also to Politiken.

05/12/12: Visit the Frederiksberg Library, for finding information on Arne Jacobsen and his buildings; access also to Politiken.

06/12/12: Visit the Frederiksberg Library, for finding information on Arne Jacobsen and his buildings; access also to Politiken.

03/01/13: Development of the theoretical framework in ANT and the revision of the literature review was sent to the supervisors.

07/01/13- 08/01/13: Internat on contributions of the PhD dissertation.
Reflections: work better on the analytical framework and on the contributions.

13/01/13: Moved to Oxford; visiting period at Said business school.

14/01/13: Advanced ethnographic studies, thought by Steve Woolgar- start to reflect on the method chapter.

15/01/13: STS course with Steve Woolgar- start to reflect on the ANT chapter.

18/01/13; Saïd Business School Winter Doctoral Conference 2011.

21/01/13: Advanced ethnographic studies, thought by Steve Woolgar.

28/01/13: Advanced ethnographic studies, thought by Steve Woolgar.

29/01/13: STS course with Steve Woolgar.

30/01/13: Reflection on the use of the ethnographic studies.

31/01/13: Ethnographic study in Woodstock.

01/02/13: Reflection on the use of the ethnographic studies.

02/02/13: Reflection on the use of the ethnographic studies and STS, ANT.

03/02/13: Reflection on the use of ANT.

04/02/13: Advanced ethnographic studies, thought by Steve Woolgar.

05/02/13: STS course with Steve Woolgar.

06/02/13: Reflection on the use of the ethnographic studies, ANT.

07/02/13: Ethnographic study in Woodstock.

08/02/13: Reflection on the use of the ethnographic studies.

09/02/13: Visiting Radcliffe camera with books on Scandinavian design.

10/02/13: Visiting Radcliffe camera with books on Scandinavian design.

11/02/13: Advanced ethnographic studies, thought by Steve Woolgar.

12/02/13: STS course with Steve Woolgar.

13/02/13: Visiting Radcliffe camera with books on Scandinavian design.

14/02/13: Ethnographic study in Woodstock.

15/02/13: Visiting the Bodelarian Library.

16/02/13: Visiting the Bodelarian Library.

17/02/13: Visiting the Bodelarian Library.

18/02/13: Advanced ethnographic studies, thought by Steve Woolgar.

19/02/13: STS course with Steve Woolgar.

20/02/13: Working on improving the ANT framework and developing the method section.

21/02/13: Ethnographic study in Woodstock.

22/02/13: Working on improving the ANT framework and developing the method section.

23/02/13: Working on improving the ANT framework and developing the method section.

24/02/13: Working on improving the ANT framework and developing the method section.

25/02/13: Advanced ethnographic studies, thought by Steve Woolgar.

26/02/13: STS course with Steve Woolgar.

27/02/13: Working on improving the ANT framework and developing the method section.

28/02/13: Ethnographic study in Woodstock.

01/03/13: Visiting the art and design library in Oxford.

02/03/13: Visiting the art and design library in Victoria and Albert Museum.

03/03/13: Visiting the art and design library in Oxford

04/03/13: Advanced ethnographic studies, thought by Steve Woolgar- and reflections after that.

05/03/13: STS course with Steve Woolgar, plus presentation of my partial analysis.

06/03/13: Visiting St. Cathrine College, Oxford.

07/03/13:Visiting St. Cathrine College, Oxford.

08/03/13: reflections on the use of the ethnographic studies.

09/03/13: Visiting St. Cathrine College, Oxford.

10/03/13: Field study in London and in the shops selling Fritz Hansen furniture.

11/03/13: Field study in London and in the shops selling Fritz Hansen furniture.

12/03/13: Field study in London and in the shops selling Fritz Hansen furniture.

13/03/13: Meeting at the Black Diamond in Copenhagen to find the books of architects explaining the values of furnitures, written in the 60s and 70s; meeting to find the documents form the 1950s and 1960s.

14/03/13: Writing up the report for the ethnographic studies.

15/03/13: Writing up the report for the ethnographic studies.

16/03/13: Writing up the report for the ethnographic studies.

18/03/13: Interviews in Spotti (milano) the showroom of Fritz Hansen, Milano; interviewees: the shop manager and the architect designing the interiors.

19/03/13: Interviews with persons buying Fritz Hansen Furniture in Italy.

20/03/13: Writing up the report for the ethnographic studies.

21/03/13: Writing up the report for the ethnographic studies.

22/03/13: Writing up the report for the ethnographic studies.

23/03/13: Interviews with persons that have copies of the Fritz Hansen furniture in Italy.

24/03/13: Interviews with persons that have copies of the Fritz Hansen furniture in Italy.

25/03/13: Interviews with persons that have copies of the Fritz Hansen furniture in Italy.

26/03/13: Interviews with retailers of Fritz Hansen in the Veneto area.

27/03/13: Interviews with retailers of Fritz Hansen in the Veneto area.

28/03/13: Interviews with retailers of Fritz Hansen in the Veneto area.

01/04/13: Back to Oxford.

02/04/13: Visit the anthropological museum in Oxford.

03/04/13: Visit the industrial design museum in Oxford.

04/04/13-29/04/13: Writing up the methodological section and the method section and presenting it to a regular basis to Steve Woolgar.

13-14-15-16/04: Fuori salone Milano; material collection on Scandinavian design and modern design.

01/05/13: Back in Denmark.

06/05/13: Meeting with John and Claus to prepare the meeting in Fritz Hansen.

07/05/13: Steer committee meeting in Fritz Hansen.

16/05/13: Interview with the CFO in Fritz Hansen.

23/05/13: Interaction with the triennial in Milano; letters and documents from the attendance of Arne Jacobsen in the Triennale in 1957.

24/05/13: Start to mobiles the paper visualising controversies.

29/05/13: Meeting with Chris Chapman about possibilities in value creation.

30/05/13: Meeting in Fritz Hansen with the documents concerning the IPS and the agreement with McDonalds.

03/06/13: Interaction with the Triennale to read the original letters written by Jacobsen sent to the exhibition.

23/06/13: Conference in Paris, presenting the paper on the role of designers.

24/06/13: Conference in Paris, presenting the paper on the role of designers.

25/06/13: Conference in Paris, presenting the paper on the role of designers.

27/06/13: Visiting the Fritz Hansen stores in Denmark, talking with the clients and with the store shoppers to understand how they perceived the value of the chairs.

28/06/13: Visiting the Fritz Hansen stores in Denmark.

29/06/13: Visiting the Fritz Hansen stores in Denmark.

30/06/13: Visiting the Fritz Hansen stores in Denmark.

01/07/13- 1/08/13: Writing up the literature review chapter.

15/08/13- 15/09/ 13: Translate all the newspaper articles collected and related to the furniture of Fritz Hansen, and categorise them in a database.

13/09/13: Linchopping- visiting Steve Woolgar.

15/09/13- 30/09/13: Insert the newspapers in the database and elaborate the codes for the analysis.

16/09/13:Talk with my supervisors about the proceeding of the thesis.

18/09/13- 18/10/13: working on the data analysis and writing up.

30/10/13: Presentation in the department of the slides for the steering committee.

31/10/13: Meeting with Fritz Hansen board of directors.

01/11/13: 28/11/13: Writing up process.

29/11/13: 2 Work in progress seminar; discussant: Robert Austin and Yutaka.

03/12/13: Discussion with Jan and John on how to improve the thesis, how to deal with some of the data.

11/12/13: Meeting with John and Claus on the following up the thesis.

12/12/13- 28/03/14: Writing up

The data were collected in a Database, Idatabase:

- 1221 pictures of newspapers articles were classified with a code referring to the picture stored in the iPhoto program, and then translated, identified with the newspaper and tagged with keywords
- 538 records concerning books, maps, letters were classified and tagged
- 81 pictures taken in museums were classified and tagged
- 241 record concerning the factory Fritz Hansen: pictures taken in Fritz Hansen and in the showrooms were classified and tagged, including the steer committee minutes, the minutes from the meetings, the financial reports, the GUF, and the interview

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