

DOCTORAL THESIS



# Re-thinking Designing

- Collaborative Probing of Work and Workplace Change

Åsa Wikberg Nilsson







# **RE-*thinking* DESIGNING**

**- COLLABORATIVE PROBING OF WORK AND WORKPLACE CHANGE**

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# ABSTRACT

The objective of the research presented in this thesis was to explore human experiences as ground for work and workplace design. The aim was to develop pragmatic tools and guidelines for work and workplace design based on a reflective design tradition. The study was undertaken between 2008-2010 in a research project called the 'Future Factory', which can be characterized as an experiment in change-by-design. The project background was a number of reports on young people opting out of industrial work and women being in the minority within the Swedish industry sector. Therefore, in this project the ambition was to particularly explore and emphasise young people's and women's ideas about future work and workplaces.

The research involved exploring alternative solutions for a future factory through a series of change interventions with a variety of actors, through a so-called '*design lab*' approach. The initial phase of this approach consisted of context mapping, as explorations of different actors' experiences through interviews and observations. The resulting material was portrayed in the form of '*Personas*'. In this project, these fictional characters were used both to communicate and explore various actors' perspectives in subsequent collaborative activities. Also, a group of young people contributed with *Future scenarios*. The scenarios were characterized as an idealized positive 'Utopia' and an idealized negative 'Dystopia', used as tools to discuss implications and alternative solutions. Both *Personas* and *Scenarios* were subsequently used in a series of *Future Workshops* with various project-related interest groups, such as industrial managers and employees and trade union representatives. In this project, a group of women and one of young people were also especially invited to explore visions of a future factory.

The research presented in this thesis contributes to practice with methods, tools and guidelines for a reflective and innovative work and workplace design. The theoretical research contribution is the correlation between theories and concepts of change, learning by doing, doing gender, and a reflective design practice.

## KEYWORDS

Design labs, design research, interventions, social innovations, Personas, future scenarios, future workshops, change, gender and design



# SAMMANFATTNING

Syftet med den forskning som presenteras i denna avhandling var att utforska människors erfarenheter som utgångspunkt för arbete och arbetsplatsdesign. Målet var att utveckla praktiska verktyg och riktlinjer för arbete och arbetsplatsdesign, som bygger på en reflekterande designtradition. Studien genomfördes mellan 2008-2010 i ett forskningsprojekt kallat "Framtidsfabriken". Detta projekt kan karaktäriseras som ett experiment i förändring genom design. Projektets bakgrund var ett antal rapporter om att ungdomar väljer bort industriarbete och att kvinnor är i minoritet i den svenska industrisektorn. Därför var utgångspunkten i detta projekt att särskilt undersöka och lyfta fram även ungdomars och kvinnors idéer om framtida arbeten och arbetsplatser i en industriell kontext.

Forskningen bestod av att undersöka nya alternativa lösningar för en framtida fabrik genom en serie av förändringsinterventioner med en rad olika aktörer, genom ett tillvägagångssätt kallat "*design labs*". Den första fasen bestod av kartläggning av industriella kontexter, genom undersökningar av olika aktörers erfarenheter i intervjuer och observationer. Detta material användes sedan för utveckling av *Personas*. I detta projekt användes dessa fiktiva karaktärer både för att kommunicera och utforska olika aktörers erfarenheter i olika aktiviteter. Dessutom bidrog en grupp ungdomar med att utveckla *Framtidsscenarier*. Scenarierna karaktäriserades som en idealiserad positiv "utopi" och en idealiserad negativ "dystopi", som användes för att diskutera konsekvenser och alternativa lösningar. Både *Personas* och *Scenarier* användes sedan i en serie *Framtidsverkstäder* med olika intressegrupper, t.ex. industriell chefer och arbetstagare och fackliga företrädare. I detta projekt var även en grupp kvinnor och en grupp ungdomar särskilt inbjudna att undersöka visioner om en framtida fabrik.

Forskningen som presenteras i denna avhandling bidrar praktiskt med metoder, verktyg och riktlinjer för reflekterande och innovativt arbete och arbetsplatsdesign. Det teoretiska forskningsbidraget är sambandet mellan teorier och begrepp som förändring, lärande, genus och reflekterande design.

## NYCKELORD

Design lab, designforskning, interventioner, sociala innovationer, *Personas*, framtidsscenarier, framtidsverkstäder, förändring, genus och design



# ACKNOWLEDGEMENT

This current research study was carried out within the research environment LTU Design Lab, at Luleå University of Technology (LTU), Sweden (2008-2010). My ordinary work tasks of teaching the subject of design in the current research included a process of rethinking design practices, methods and processes, in collaboration with a variety of project actors. For this knowledge production, I am very grateful. In writing this thesis, I am therefore indebted to many people, companies and institutions.

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Luleå, January 2012

A handwritten signature in black ink, appearing to read 'Åsa Winberg', followed by a horizontal line.



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## APPENDIX 1

Paper 1

Wikberg Nilsson, Å. & Johansson, S. (2010). Reflection-for-action: A collaborative approach to the design of a future factory. In P. Vink et al.'s (eds) *Advances in Occupational, Social and Organisational Ergonomics*, pp. 10-19. Boca Raton, Fla.: CRC Press

## APPENDIX 2

Paper 2

Wikberg Nilsson, Å., Fältholm, Y. & Abrahamsson, L. (2010). Reframing practice through the use of Personas. *International Journal of Reflective Practice*, Vol. 11, No. 3, pp. 285-298

## APPENDIX 3

Paper 3

Wikberg Nilsson, Å. & Fältholm, Y. (2011). The Future Gap: Exploring a critical reflective stakeholder approach. *Journal of Management and Sustainability*, Vol. 1, No. 1, pp. 18-31

## APPENDIX 4

Paper 4

Källhammer, E. & Wikberg Nilsson, Å. (forthcoming 2012). Gendered Innovative Design – Critical Reflections stimulated by Personas. In E. Gunnarsson, E. Sundin, K. Berglund & S. Andersson's (eds) *Gendering Innovation*. Stockholm: Vinnova



“Design is 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 humanization of technologies and the crucial factor of cultural and economic exchange. /.../Together, these activities should further enhance – in a choral way with other related profession - the value of life” (“Definition of design”, 2011)

# 1 INTRODUCTION

This thesis in the subject of Industrial design portrays research undertaken in a three-years project called the ‘Future Factory’. The research in this project can be described as an experiment in change by design, with the overall objective of exploring, probing and developing tools and guidelines for innovative and gender-aware work and workplace design for the Swedish industry sector. The main emphasis of this thesis is on the project approach of ‘design labs’, which I here define and apply as follows;

Design labs are small-scaled, explorative design interventions that involves everyday people in future imaginations and innovatively thinking of alternative solutions for a positive change

The definition of design that I use throughout this thesis is based on the International Council of Societies of Industrial Design (ICSID), as outlined in the quotation above. The foremost principle of this, I think is to seriously consider design as a subject concerned with making products, processes, services, systems, and environments of value for people.

Moreover, as Thackara (2006) states, designers are to some extent futurologists, since they deal with future creations. The ambition of applying a design lab approach in the current research was therefore to probe change by design in the development of a vision of a future factory, in collaboration with a variety of actors.

The idea was to re-think work and workplace design through explorations of various experiences and values industrial work and workplace design might engender. For example, a starting point for the research in the Future Factory project was that young people are opting out of industrial work and that women are in minority in the Swedish industrial sector, further described in upcoming sections. Consequently, the aim was to probe and develop methods and guidelines for work and workplace design that has value for a

variety of individuals, including women and young people, for industrial businesses and possibly even for society.

Performing research as outlined in this thesis draws inspiration from a reflective design tradition, and is an example of qualitative and explorative research through design. This can be exemplified in the rethinking of established design methods such as *Personas* and *Scenarios*, implemented in *Future Workshops*. The research idea was to use a design approach to explore human experiences as ground for innovative work and workplace design. Also, the research included a rethinking of the concept of innovation. Most definitions of innovation derive from Schumpeter (1983), outlining innovation by its contribution to growth and new businesses in society. In contrast, and as starting point for the current research is Brown's (2008) characterization of innovation by its contribution to improve people's life worlds.

The main challenge of a collaborative design research approach seems to be to stimulate people to reframe mind-sets<sup>1</sup>, in a reconstruction of dominating logics of 'what is', in order to think innovatively of 'what might be'. My ambition with this thesis is therefore to explore a rethinking of designing in ways that may contribute to making a positive change.

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<sup>1</sup> Mind-set: a particular way of thinking: a person's attitude or set of opinions about something (the Merriam-Webster dictionary [www.merriam-webster.com](http://www.merriam-webster.com) 2012-01-10)

# 1.1 THE FUTURE FACTORY PROJECT

In this section I give a brief outline of the Future Factory project, in order to provide an initial outline of the concerns and context of the current research.

The initial inspiration for this project was Volvo Car Corporation's concept car YCC (Your Concept Car), developed by a team of women, with the aim of including women's needs without excluding men's (e.g. Backman & Börjesson, 2006; Peterson McIntyre, 2010). The aim of promoting the YCC project was the stated intent to reach new customer groups (women), and to support women reaching top management positions (Peterson McIntyre, 2010). In similar ways, the idea of the Future Factory project was to use a design approach to explore the situation of few women and obsolete structures in the Swedish industry sector, and to subsequently engender various alternative futures.

## PROTOTYPING FUTURES

The Future Factory project was undertaken in three partly parallel phases of inspiration and preparation, and two phases of collaborative design space explorations. Firstly the collaborative phase involved various interest groups, and secondly, the group exclusively comprised women. The first phase included context mapping through interviews and observations. This preparation and inspirational phase resulted in the development of Personas, that is, fictional characters that were used in the subsequent collaborative project activities. The second phase involved Future Workshops with a number of actors who in one way or another were seen as having an interest or a stake in the future of Swedish industry. The interest groups of participating actors were representatives for industrial management, industrial employees, trade unions, and young people. The group of young people developed Future Scenarios, later portrayed as one utopic<sup>2</sup> future

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<sup>2</sup> Utopia: a place of ideal perfection, especially in laws, government, and social conditions. Originally from Utopia by Sir Thomas More, 1516. From the Greek ou (not) and topos (place) (From the Merriam- Webster dictionary [www.merriam-webster.com](http://www.merriam-webster.com) 2012-01-08)

vision and one dystopic<sup>3</sup> future scenario of fears and concerns. Those scenarios were applied in activities with other project actors, to challenge or even provoke prevailing logic.

## **PROBING CHANGE**

In retrospect, the Future Factory project was a rather extraordinarily research project, at least compared with more traditional research projects.

Firstly, it was special in the experimental design research approach, as research through design generally differs from more traditional natural and social science research. Secondly, the research intention of probing change in collaboration with a wide variety of stakeholders is another aspect that characterizes this project from more traditional research objectives and procedures.

The concept of 'stakeholders' is another aspect that was distinctive. In the current study it was defined similar to Donaldson and Preston's (1995) argument of stakeholders as a group of people who basically have an interest in some aspects of corporate activity. In this view, stakeholders are identified without consideration of whether the organisation has any interest in them. Like them, I consider that stakeholders' interests are of intrinsic value, meaning that each group is considered based on its own interests and not in relation to furthering the interests of other groups, such as business managers or shareholders.

Moreover, the notion of experiment can be considered as special in this project. Whereas the focus area was the Swedish industry sector, the research work was undertaken through the 'design labs' approach, which mostly meant activities outside industrial contexts. This resembles Jungk's (1987; Jungk & Müllert, 1989) description of 'social experiments' or 'social innovations', and Brandt's (2001), Binder's (2007) and Binder and Brandt's (2008) portrayal of 'design labs' as small-scale experiments in change. Such a research approach is significantly different from traditional research experimentation, as the objective rather is to test the experience of new methods and imagine alternative solutions. Put differently, with inspiration from Simon (1996), the research approach applied in the current study involved questioning and challenging, "the way things are", in order to discover possibilities of "how things could be".

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<sup>3</sup> Dystopia: an imaginary place where people lead dehumanized and often fearful lives. (From the Merriam- Webster dictionary [www.merriam-webster.com](http://www.merriam-webster.com) 2012-01-08)

# 1.2 CHANGE BY DESIGN

The research focus of probing change by design can be motivated by several factors, as further detailed in the subsequent sections and in the appended Paper 1 to 4. Before proceeding to the other thesis sections, in this section I will sketch the background to the current research, and hence my arguments for change by design.

## CHANGE FOR INNOVATION

Change and innovation are rather difficult concepts to grasp. Like Schön (1973), I notice a discrepancy between on the one hand that people in general accept the idea of change and innovation and support dynamism, and on the other hand, that the guiding logic seems to involve un-scrutinized norms and non-reflected habits and practices. This is, in my view, one reason why serious innovation is a rare phenomenon, meaning that people in general do not radically challenge traditional ways of thinking and doing. Lewin (1947; 1948) stresses that every human's life space is formed by upbringing, experiences, education, social interactions, and so on, which all shape viewpoints in various respects. Like Lewin, I consider that prevailing logics need to be challenged and provoked, for new thinking to be possible. This is relevant, as talk of change and innovation is often applied in the sense of very small steps that do not involve fundamental consideration of what guides strategies and practices. Correspondingly, this can be one reason why, for example, workplace change does not result in the sought-after effects, but instead ends up like before the attempted changes.

Another illustrative consequence of this limited mind-set in relation to innovations is Schön's (1973) description of a potato chip company seeing a larger bag of potato chips as a new product innovation. For this company to actually be involved in thinking in radically new ways, there seems to be a need for a different approach, that is, an approach that questions and seriously challenges traditional ideas, content and procedures. Obviously, a relevant question in this respect could be whether there actually is a need for thinking innovatively, a larger potato chip bag can of course in some ways be a satisfying solution that contributes to the company's sustained production. This distinction between a radical and an incremental innovation is characterized as the difference between substantial changes and the small steps of a less obvious

change (Schmidt, 2005). The aforementioned development of a potato chip bag is, for example, most certainly closely related to this company’s existing capabilities and knowledge of both internal and external demands. Radical innovation on the other hand, according to Schmidt “... implies a break which tends to make the existing routines obsolete” (2005 p. 132). Of course, incremental development is sometimes a good enough solution, but on the other hand it can sometimes be the only strategy known to the company. However, there is occasionally a need for thinking in radically new ways – in ways that tear down old structures and create imbalance in the stable state in order for change and innovation to actually happen. Figure 1 visualizes various business strategies, with inspiration of Brown and Katz (2009).

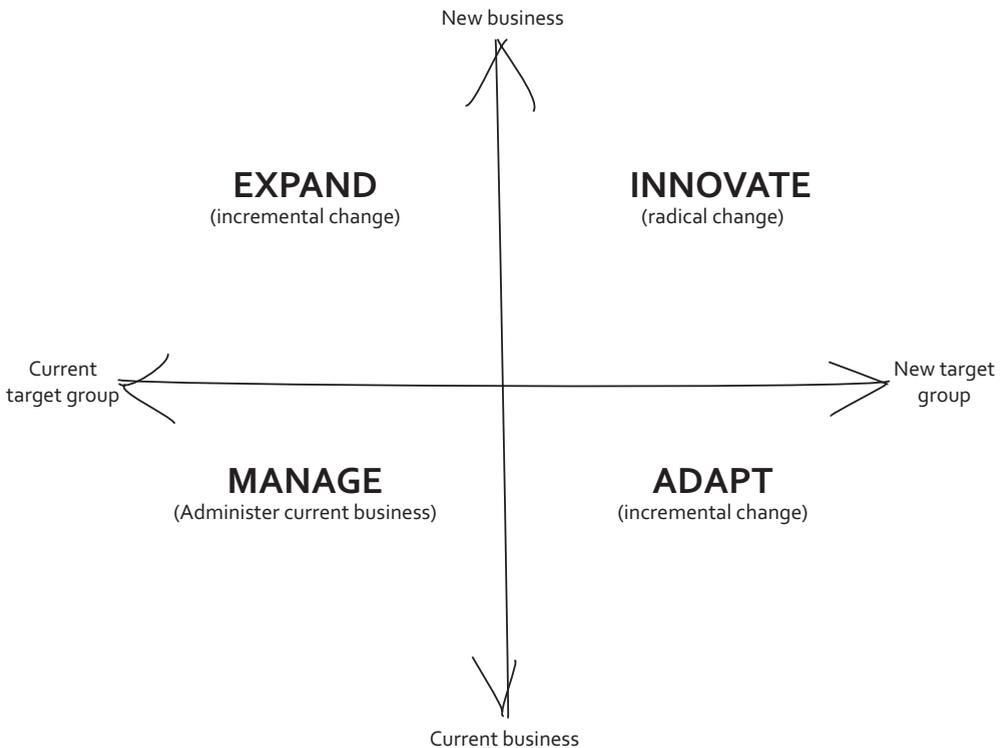


Figure 1. Illustrates various business strategies.

I concur with Kanter (1988), who describes innovation as a set of activities carried out by individuals and groups in processes that are stimulated, facilitated and enhanced (or the opposite) by structural and social factors. My argument is, therefore, that radical

innovating occurs in processes in which people are reformulating, restructuring, and challenging conditions, traditions, strategies, norms, and practices. In short, innovation in my view requires a rethinking of basic objectives.

To illustrate this, one way for the previously mentioned potato chip company to be seriously involved in change and innovation could be to develop ideas for significantly different products that can be manufactured within their current production system. Another option could be to create significantly different production processes to manufacture their current products that decrease costs, using production technology that is new, and/ or is better adapted to the human body to decrease occupational ill-health. Another option, and even easier to justify in the current competitive situation, would be to radically challenge current work and workplace strategies and cultures with the objective of developing a long-term innovation culture.

To summarize, one way for a company to be seriously involved in innovation can be to focus on its idea generating processes based on questions that include who is involved, what is new, new to whom and what are the socio-economical consequences of various alternatives (Rickards, 1985; Kanter, 1988; Johannesen et al., 2001; Rogers, 2003). However, as mentioned before, creativity and innovation imply a reframing of mind-sets and a challenging of prevailing logics (deBono, 1968; 1978). In short, one needs to think different to become innovative.

## **BEYOND THE POST-INDUSTRIAL AGE**

Sweden has a long-term history of industrial production, but this stability of relying on continuity of technologies and procedures can, however, be another reason for the need to think new. For example, one reason can be the metamorphosis that contemporary societies seem to be undergoing in the current paradigm shift from the industrial age to what is referred to as a post-industrial or a knowledge-based society (Bell, 1976). In many of the West societies, this transformation involves increasing public and service sectors at the expense of the industrial sector (Ingelstam, 1997). Whereas the industrial sector is producing more than ever before, there seem to be fewer and fewer people involved in industrialized processes. Technological efficiency driven to an extreme may even result in the industrial shop-floor worker disappearing completely. A consequence of this is disruption in the former stability of the

industrial sector as the main provider of work and workplaces in Sweden.

Furthermore, there is a contemporary trend of moving industrial production to low-wage regions or countries, which seems to be motivated by 'knowledge-based work' remaining in Sweden and Europe. The loss of repetitive and monotonous work tasks is in my view not something to grieve, but in moving production to low-wage countries there is also a loss of recognition of Swedish production as a quality trademark. The identity of a product 'Made in Sweden' will hence be lost. Whereas the industrial sector was considered the main provider of work and growth in society during the so-called industrial age, in the current economy there seems to be more focus on services and information-based management. Consequently, my argument is that there is a need for change if industrial production is to exist in Sweden at all in the future.

Both before and after Taylor's *Principles of Scientific Management*<sup>4</sup> (1967) there have been numerous management concepts of how to best streamline industrial production systems. Within most of these concepts, however, the focus seems to be on change in small steps in adapting production technologies, decreasing costs, and rationalizing production processes. In contrast, the practice could be that of being proactive and innovative in designing radically new products, processes, practices, and methods. Such practice would additionally seriously challenge the previous ways of doing things. Put differently, it is a question of developing an industrial innovative work and workplace culture that is based on the Swedish quality production trademark. Efficiency and rationality have been the prevailing logic during the industrial age (Rittel & Webber, 1973).

Perhaps it is time for a paradigm shift, which enables a start of a creative industrial sector in an innovative age, that is, to be rethinking Swedish production as "Made Innovatively in Sweden".

## **GENDERING INNOVATION**

It is relevant in respect of change and thinking innovatively to question some general conceptions. For example, Simon (1997) uses the concept of 'bounded rationality' to describe the notion that decision-makers often have a limited awareness of alternatives. This means an incomplete understanding of implications, and little or no

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<sup>4</sup> Taylor's ideas of Scientific Management concerned e.g. to develop the most efficient and productive work practice for each work task (Taylor, 1967)

consideration of various future scenarios. A general belief is that decisions always are taken on rational grounds. In contrast Simon argues that decisions are based on decision-makers' own subjective understanding of a situation. In this view a 'satisficing' solution is described as a solution that is 'good enough' or satisfactory without explorations of alternatives or implications. According to Simon, this so-called 'bounded rationality' is dominant within many organisations.

While I agree with Simon's argument that strategy is all too often about 'good enough' solutions, I consider there to be a lack of reasoning about who is, or should be, involved in the process. For example, Bellgran and Säfsten (2005) describe how managers in general make decisions on change and development in the Swedish industry sector, and subsequently a few production engineers implement the changes. I propose that this illustrates the implications of Simon's (1997) reasoning of a bounded rationality. That is, few people involved in the decisions and implementation may involve a narrow solution space. Consequently, the prevailing logic of the industrial age can be an implication for change and innovation.

One illuminating example of implications of prevailing logics, I consider to be the stable state of gender inequality. This has been uncontested for a long time, even though people in general seem to accept gender and diversity as important aspects. A relevant question in this respect is whether innovation can contribute to gender equality. According to Rogers (2003), this can be one outcome if change, development and innovation are considered in terms of socio-economical consequences. The pragmatic implementation of gender equality plans does however illustrate that people seem to talk of very small steps that does not fundamentally tear down obsolete structures or seriously consider consequences, before building something new.

Like Hirdman (1988) some twenty years ago, I note that Sweden still has a gender-segregated labour market<sup>5</sup>, despite often being used as a role model in terms of gender mainstreaming. This can be exemplified in that, in terms of numbers, women dominate in the public sector, and likewise men in the industrial sector (Statistics Sweden, 2010a; b). There seems however to be a

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<sup>5</sup> The notion of a labour market obviously presupposes a definition of what counts as labour. A general notion is paid work. However, unpaid work with household tasks, care for children and relatives is everyday for many women in Europe and the world as a whole. In Sweden, such previously unpaid labour was transformed into paid labour with the development of the public sector.

growing awareness of the imbalance between women and men when it comes to among other things power, influence, participation, opportunities and limitations. Whereas men throughout the industrial age have dominated the work and workplace scene in these respects, it appears as if the larger proportion of Swedish women undertaking paid labour has unsettled some previous stable states.

Gender mainstreaming is also a concept that most organisations in Sweden have to somehow relate to in gender or diversity plans. European Commission policy on gender mainstreaming is set out as follows:

“Equal participation of women and men in all aspects of society is crucial for lasting growth and democracy. It also symbolizes a society’s level of political maturity” (European Commission, 2005 p. 2)

Yet, in this report, the ambitious goal of gender equality is considered far from achieved. As stated: men still to a large extent mediate women, whether as family members, employers or even providers of credit. Following the above quotation, this is an indication of a low level of political maturity in European countries, Sweden included. This is described as follows:

“The labour market still favours men over women and reflects and reinforces men’s and women’s perceived roles in the home, polarising existing divisions despite clear evidence that the lifestyle of the majority of women but also of many men no longer fits into these tight compartments.” (European Commission, 2005 p.2)

Despite a growing awareness of gender inequality and a need among both women and men for more balance in work and family life, there still seems to be stagnation in some obsolete structures and practices. For that reason, I argue that there is a need for a rethinking of the underlying often un-reflected causes and origins of inequality.

Acker (2006a) for example clarifies inequality as the process of ‘doing gender’, in the sense of what is considered to be female or male is being constructed and re-constructed within rational bounded systems of institutional structures, interactions, symbols and identities. West and Zimmerman further describe ‘doing gender’ “...both as an outcome of and a rationale for various social arrangements and as a means of legitimizing one of the fundamental divisions of society” (1987 p. 126). Put differently, the dominant logic of inequality, the doing of gender, is constructed in

stereotypical presumptions of women and men, expressed in what people say and do, and in how people act in both individual and institutional arenas (Acker, 1990; West & Zimmerman, 1987).

## **RETHINKING DESIGN AND GENDER -FOR INNOVATION**

A relevant question can be how the concepts of equality and innovation are related and concerned with the current research study. Firstly, I argue that gender inequality indicates some institutionalized social orders that despite a rhetorical approval involve non-approval in practice. My argument is hence that such prevailing logic is part of the very same rationalities that need to be challenged, or even provoked into thinking differently. Secondly, since decision-making is based on subjective perspectives of the people involved (Simon, 1997), I argue that men's domination in decision-making and design of workplaces, work processes, and end-products is not necessarily all-encompassing or gender-neutral.

As was the case in the YCC project, many companies are beginning to realize that they have somehow disregarded half the world's population in their marketing and design of products. However, despite the neglect of women's contributions to change and development, I must emphasise that I do not consider that women necessarily have other needs or want other types of products, since that only contributes to a dichotomy between women and men. I do however, like Kanter (1988), argue that a diversity of people involved in decision-making and design processes contributes to realization of a variety of alternatives and thereby, possibly, also a contribution to radical innovations.

Therefore, I consider that a merger between gender theories and design practice can contribute to new ways of thinking that have the potential to be relevant to both gender equality and innovation.

## **SUSTAINABLE LIFE WORLDS**

Another reason for the need for rethinking in Swedish industry is growing dissatisfaction in society over aspects of environmental concern, economic materialism, bounded rationality, standardization and institutional rigidity. These are all aspects that can be expressed as requests for sustainability. My argument is therefore that the concept of sustainability has the capacity to embrace environmental, economic and social dimensions that both

business and ordinary people can relate to. In the often-quoted *Brundtland Report*, the World Commission on Environment and Development (WCED, 1987) defines sustainability as follows:

“Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future“ (WCED, 1987 p. 40)

In the WCED report, the question is asked how long humans can continue to pretend that environment and human health are not part of the economy. It is relevant to this concern that young people often are seen as ‘leaders of change’ (The Swedish Youth Board, 2007) hence aspects of dissatisfaction can be found among groups of young people. In the current research study this was important since young people are said to opt out of industrial work (Ziebertz & Kay, 2005; Lindgren et al., 2005). Likewise, this is said to be due to an opinion among young people that the industrial sector has an instrumental focus on rationalization and discipline (Gillberg, 2010). In contrast, young people of today are said to value ‘free’, creative, and challenging work tasks (Ziebertz & Kay, 2005; Lindgren et al., 2005; the Swedish Youth Board, 2004; 2007).

Moreover, the numerous management concepts that generally emphasise efficiency and productivity are often shadowed by requests for more sustainable and humane work situations. For example, principles of the ‘good work’ were developed in the ‘Industrial Democracy’ project (see Thorsrud & Emery, 1964; Emery et al., 1969) in Norway in the 1960s<sup>6</sup>. The basic principles for good work according to them are:

1. The need for work contents that involve variation and that require something beyond endurance
2. The need of workplace learning throughout working life
3. The need to be able to make decisions at work, at least within a certain area that can be referred to as one’s own responsibility
4. The need for respect and a good psycho-social work environment
5. The need to understand the work in relation to the whole work system and the outside world, at least to be able to see work tasks as useful and valuable
6. The need to ensure that the work can be combined with future hopes, which does not necessarily involve job promotion.

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<sup>6</sup> This was followed in Sweden by the Swedish Metal Union’s development of criteria in 1985 (Metall, 1985).

There seems to be a discrepancy between on the one hand the general management concept focus on efficiency and on the other hand principles for more humane work situations. For example, within many industries there are still noisy working environments, there are still a lack of daylight, and there are still monotonous work tasks, albeit with more technology today than in Taylor's early 20<sup>th</sup> century.

My argument is that there is a need to resume discussions regarding work and workplace design that can contribute to create both sustained and sustainable production. By realizing human capabilities, there is also a possibility to attract more young people and more women to the industrial sector, and a chance to develop innovative workplace cultures that can be one contribution to products 'Made Innovatively in Sweden'.

# 1.3 RESEARCH OBJECTIVE AND AIM

The overall objective with the current research was to explore human experience as base for innovative work and workplace design.

To explore meaningful and innovative solutions for work and workplace design in my view begins with understanding people's experiences, needs, values, goals and aspirations for the future. Initially, in the current study the qualitative research questions were broad, and included strive for deep understanding a variety of stakeholder's experiences, perceptions and desires. For example: How to explore people's experiences of industrial work and workplaces in a way that can guide design efforts, how to reveal opportunities and remove barriers in the form of current logics and practices in order to think innovatively, how to stimulate a gender-aware design, and how to understand and represent knowledge production in the collaborative work. Those questions are further explored in the following sections.

The relevance of this research study is primarily for development of practical methods and guidelines for work and workplace design, and secondly for the theoretical correlation between concepts of change, learning by doing, doing gender, and reflective practice.

## AIM

- To develop guidelines, methods and tools for collaborative and innovative work and workplace design that contributes to embracing a diversity of experiences and values, and thereby contributes to stimulate thinking innovatively

# 1.4 THESIS OUTLINE

This is a compilation thesis, which means that the research procedures and conclusions are mainly presented in the appended Papers 1 to 4. The summarizing ‘chapter’ of this thesis consists of several sections, which I further outline and motivate below.

The first part of this thesis, as the reader will no doubt have noted, includes a brief outline of the research study undertaken in the Future Factory project. This first part also includes background for this project: as some reasons for a rethinking of the Swedish industrial sector. The industrial sector has a long and impressive history of developing and refining technologies. However, a move beyond the post-industrial age in my view requires thinking innovatively and an inclusion of various experiences and meaning, in decision-making, change and design.

In the second part of the thesis I outline the current research as pursued within a technical domain, but with an underlying ideology of reflective analysis rather than technical rationality. In this part, various types of knowledge production in research are described. Action-based research, or foremost research through design, is also outlined, since this approach was applied in the current study.

The frame of reference in part three involves some theories of change, design and gender and how they relate to the current research.

The fourth part of this thesis is called Design Labs, and includes the methods applied in the current research interventions. This section starts with an exploration of the Future Factory project, as the idea of design labs can be seen as a method that engenders and diffuses research ideas. The first phase of this project involved exploring various experiences and meaning in a context mapping conducted through interviews and observations. The following phases of the project were a series of workshops with various interest groups.

A summary, of the appended papers and some related publications, is provided in the fifth part.

The sixth and final part of this thesis concerns the results of the current research study’s various phases. There are for example results from the context mapping and how this was used in the subsequent activities. This part also includes the results and experiences of refining the *Persona* method for work and workplace design, as well as the results and experiences of using idealized

*Future Scenarios.* The results of the collaborative activities, such as to work with visions, some experiences of collaborative research work, and the explorations of gender-aware designs are further described in this section. Besides the conclusions regarding guidelines and methods for work and workplace design, there is also a summary of experiences gained as reflections-on-actions both in the project and as implications for further work.

# 2 RESEARCH IN A REFLECTIVE PRACTICUM

In this section I outline the epistemological<sup>7</sup> foundation of the current study, through a discussion of various ways of understanding and building knowledge within design research. One generally talks about research in the singular, as if there were only one entity. This is of course not the case, like so much else there is a wide range of research fields, practices and methodologies with various procedures and ideologies. Usually it is only when various fields are confronted with each other that differences are revealed. Thomas Kuhn (1970) refers to this as different research paradigms, in the sense that a paradigm is a model from which a specific research tradition originates. In most research paradigms, the search for knowledge is vital. It is generally *how* to build knowledge, and *what* knowledge is, that differs.

Design research is a field that by tradition is within a technical domain, however often with an epistemological base between the social sciences and the natural sciences. Some design research seems to adopt an epistemology of technical rationality. Others have an epistemological base in reflective analysis. This is further described in this section. Research-through-design (Frayling, 1993) was in the current research study seen as a way to build both theoretical and practical knowledge in collaboration with practitioners.

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<sup>7</sup> Epistemology: here applied in the sense of the study or theory of 'reality' and grounds of knowledge. Within various research fields there are different ideas of what knowledge should concern, various ways of finding knowledge, and various ways of defining validity, that is, various epistemological foundations (Definition of epistemology: c.f. the Merriam-Webster dictionary [www.merriam-webster.com](http://www.merriam-webster.com)).



# 2.1 RESEARCH POSITIONING

In order to position myself I start with an outline of two research paradigms that both concern the subject of Industrial design, here referred to as technical rationality and reflective analysis.

## TECHNICAL RATIONALITY

The first epistemology is *technical rationality*, involving a systematic rational problem-solving methodology and with a base in a positivistic research paradigm. In the 1960s, there were doubts on the scientific qualities of the design discipline. As Dorst (1997) puts it, design was seen as an abstract fuzzy practice without a clearly articulated methodology. Thus, there was a wish to develop a theoretical framework adopting a scientific abstraction of analysis, synthesis, evaluation and decision. This model is often applied in a linear problem solving approach, which still dominates technological and product development today<sup>8</sup>.

Flyvbjerg (1998) describes rationality as power, in the sense of rationality is constructed and defined by the ones that holds the power. This means that what is seen as rational choices are defined by some power holders without a serious consideration of what the ground of those so-called 'rational choices' are.

Aristoteles once discussed varying types of knowledge as *episteme*, *techne* and *phronesis*. *Episteme* is defined by Flyvbjerg (2001), as scientific knowledge carried out with analytical rationality, it concerns to know why, and *techne* concerns the technical to know how. The epistemological foundation of technical rationality concerns both *episteme* and *techne*, in the search to know why and to know how. For example, Simon (1996) developed his *Science of the Artificial* based on criticism of planning and decision-making. His ambition was to develop a new paradigm of design that would overcome this in a model that described to know why (find the problem) and to know how (problem-solving methods). His oft-quoted argument is:

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<sup>8</sup> A linear problem-solving approach is here defined as starting from a pre-defined problem and dividing that problem into sub problems that are solved separately. However, as Schön (1983) argues, such a process risks creating new problems by not fully understanding the problem setting, and therefore risks not providing a solution that fit in its intended context.

“The natural sciences are concerned with how things are./.../ Design, on the other hand, is concerned with how things ought to be.” (Simon, 1996 pp. 114-115)

Whereas I agree with the characterization of design being concerned with future betterment, I consider Simon’s reasoning to illustrate a bounded mind-set. For example, in Simon’s model the main aspects are those of functions, goals and adaptation. Consequently, artefacts, systems or environments that are developed based on those aspects do not consider the use situation, context dependency or how artefacts contribute to individual and institutional values in society as a whole. Flyvbjerg (2001) refers to such aspects as *phronesis*, that is, understanding what gives value and to develop guidelines that support decisions and find new alternative solutions that are valuable for the people concerned. The knowledge production in the paradigm of technical rationality therefore can be said to consist of technical rationalisations with a lack of human interrelation.

Moreover, even if rational design methods can be functional for improvements or incremental change, there was from the start criticism for the lack of space for creativity and innovativeness in the pre-defined linear problem solving models. For example one of the former design method founders, Alexander (1971), even stated that there is so little in what are called design methods that has anything useful to say about designing. Insofar as design methods can improve designing, he argues that it can be by studying what makes a specific situation or object satisfying; the underlying meaning for the people of concern. This is in Alexander’s view, an insight that technical rationality models do not support. In contrast, he considers that people should design for themselves, which I consider to mean that the foundation should be explorations of human experiences and values.

Another of the former design methods proponents, Jones declared that; “...In the 1970s I reacted against design methods. I disliked the machine language, the behaviourism, the continual attempt to fix the whole of life into a logical framework” (1977 p. 57). Jones further argues in favour of thinking of design as meetings, across the Cartesian split of mind and body, to enable us to find means for collaboration in the composing of contexts that make sense to people. Based on my consideration, his criticism deals with the technical rationality model not supporting the whole use situation as an essential feature of how a product, system, service, environment or building is experienced. In the same way, I

therefore consider that the epistemological foundation of the technical rationality model lacks usefulness for design. Hence, I see a need for wider and all-embracing knowledge production for design.

## **REFLECTIVE ANALYSIS**

A differing epistemological example is *reflective analysis*, with inspiration drawn from a qualitative research tradition of for example phenomenology, hermeneutics, and ethnography. The previously mentioned Alexander (1979) elsewhere suggested studying phenomena without analysing causes or origins. He considered that design is about understanding patterns present in certain contexts, and about creating a solution that fits those patterns. I agree with organizing found patterns into a holistic unity as one of the main design tasks. However, I suggest that a design practice must to some extent also explore causes and origins of certain phenomena, in order to fully understand problem setting, and hence create desirable outcomes.

In addition, the rational ideal is to provide knowledge that is context-independent. In contrast, Jones's (1981) view is that design knowledge is not generalizable because of the immense context dependency in design; solutions are developed based on the patterns present in a specific given context and can therefore not be generalizable.

Dewey did not develop his notions of 'learning by doing' (2008) and 'reflective thinking' (1998a) in the 20<sup>th</sup> century based on a science of design. Even so, I consider his considerations to provide a fundamental base for an alternative pragmatic design theory. Like Dewey, I define reflection as bringing formerly unconscious aspects of experience and practice to attentiveness and thus better allowing for conscious choices. Dewey puts this as follows:

"One of the consequences of action is to involve us in predicaments where we have to reflect upon things formerly done as matter of course. One of the chief problems of our dealings with others is to induce them to reflect upon affairs, which they usually perform from unreflective habit." (Dewey 1998a p. 321)

I see Dewey's intention with critical reflections as a questioning of the rationality of some decisions and practices. This, he means, is vital for both individuals and society as a whole, as we otherwise accept norms, practices, attitudes, and values we might not knowingly support. Reflection therefore means to bring to

awareness various perspectives and experiences of the world, and thereby fundamentally to think differently from there on. Dewey (1998a) further discusses reflection upon action as a way to analyse and understand a situation, and as a way to make better future decisions.

This is something that Schön further developed, in *The Reflective Practitioner* (1983; 1995) and *Educating the Reflective Practitioner* (1987). The philosophy of reflective analysis that Schön describes is revolutionary since it differentiates design from technical rationality, while it exists within the same research domain. As I understand Schön, he can be said to adopt a reflective design practice in his texts, meaning that he offers little direct guidance to what design knowledge is or how it can be acquired, but illustrates design knowledge as based in the practical action of performing design. I consider the reflective practice to correlate to the previously mentioned concept of learning by doing (Dewey, 2008) and the 'Aristotelian' concept of *phronesis*, as the practical knowledge that can be developed in and on a given situation.

The lack of guidelines in Schön's description of qualities of a reflective practitioner can also be seen as part of his critique of the formerly-mentioned technical rationality. As I understand his idea, it is to provide a foundation for a design epistemology, without limiting it to a set of rigid methods or routine procedures.

In a similar way, Cross (2006) once said that the practice of design has its own distinct things to know, ways of knowing them and ways of finding out about them. Thus, in an epistemology of reflective analysis, knowledge is seen as produced in the action, as well as in the critical reflections on the actions taken, and foremost with an emphasis on what gives value in a given situation.

In summary, I define an epistemology of a reflective design practice as knowledge building by thinking and doing design, which means a practice that builds understanding by both body and mind. The context-dependency of design outcomes means that knowledge production cannot be generalizable to a specific model. However, some guidelines of how to support reflective processes can be developed by experience. This is further discussed in the upcoming sections.

## 2.2 KNOWLEDGE PRODUCTION

In the previous sections I describe the current research study's foundation in a reflective analysis tradition. In this section I discuss various ways of building knowledge in such a tradition.

The knowledge production and meaning of knowledge in a reflective analysis have parallels to Novotny, Scott and Gibbon's (2001) development of Mode II as a concept of how to build scientific knowledge through collaborative, action-based and 'real-world' problems. In a Mode II paradigm, knowledge is always action-based and presupposes an interdisciplinary practice in the collaboration between research, business and society. Whereas the Mode I type of knowledge production is satisfied with theoretical reasoning, an action-based approach to knowledge production is concerned with both theoretical and practical knowledge building.

### CHALLENGING LOGICS

To me, knowledge in action involves an underlying base in a qualitative hermeneutic research tradition of interpretation of reality as it is experienced, rather than accepting reality as it is. For example, Sartre states, "...subjectivity must be our point of departure" (Sartre & Elkaïm-Sartre, 2007 p. 20). This is by him exemplified as a craftsman developing a paper knife by referring both to knowing what a paper knife is (know why), and knowing what production technique to apply (know how). According to Sartre, this is viewing the world from a technical rational standpoint. In contrast, drawing on Heidegger, he argues that there is a human reality that precedes essence. I consider this to mean before knowing what a paper knife is and how to produce it. This is what I understand as challenging the prevailing logic of reality as a stable state, and hence accepting "the nature of things" as non-changeable. It can be exemplified as turning some stable states upside down in a search for new meanings and new ways of doing things formerly done without reflection. For the previous craftsman it can involve to question what a paper knife is, in the sense of what usage a paper knife can have, how to manufacture a paper knife, or basically question what a paper knife is. This would involve a return to fundamental basic needs there are for the

specific situation, and develop something new based on those new insights, hence, create an innovation.

To escape the prevailing logic of what a thing is, how it should be manufactured, or how it should be used, is however not easy. For example, Redström (2066) discusses that things we have institutionalized are more difficult to transform, for example, compared to new technologies that are not as of yet part of established experiences and perceptions.

Design practice is in general seen as based on intuition and subjective ways of working, as it involves creativity, this sought-after ability, and implicit actions that in retrospect are difficult to express. This can be likened to Lévi-Strauss (1966) referring to the qualitative researcher as a '*bricoleur*'...a "jack of all trades or a kind of professional do-it-yourselfer" (1966 p.17). Nelson et al. (1992) describes this as a choice of practice that is pragmatic, strategic and self-reflexive. The description of a '*bricoleur*' type of knowledge production corresponds to the current design research approach, and is therefore relevant to outline.

However, the distinction is that a grounded theory<sup>9</sup> approach to knowledge would include a totally open mind-set without any presumptions, what Sartre might well describe as without human essence. The '*bricoleur*' approach in the current research study involved exploring phenomena with an open mind, and questions some prevailing logics, further developed in the coming section.

## **RESEARCH PROBLEMS IN DESIGN**

In proposing a reflective approach, my positioning also involves a somewhat different approach to defining research problems. For the current research this involved Schön's (1983) argument that research questions should emerge through an exploration of the problem setting. This contrasts a research approach that involves developing a hypothesis in prior research and with a predefinition of what theoretical framework to apply.

The reason for this '*bricoleur*' inspired approach is my understanding of that many conditions of the world are dynamic. Since problems seldom present themselves in predefined neat packages, I coincide with Rittel and Webber's (1973) description of

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<sup>9</sup> Grounded theory, developed by Glaser and Strauss (1967), involves an open-minded approach to data collection, and a qualitative interpretation of research material, and a subsequent development of theory. This contrast research in which one chooses theoretical framework and develops a hypothesis prior research, therefore, according to them, it can lead to ground-breaking results.

'wicked problems', as complex ill-defined situations that cannot be solved using a technical rational linear approach. In contrast, as Rittel and Webber argue, the most difficult problem is that of defining what the problem really is (exploring why), meaning that the approach should be concerned with "...identifying the actions that might effectively narrow the gap between what-is and what-ought-to-be" (1973 p. 159). Research problems in design in my view involves qualitative open-minded explorations of what is and what ought to be. Therefore, it additionally involves the aforementioned *phronesis*, in the sense of exploring and learning through explorations of experiences and values, as well as the quantifiable functions and requirements of a given situation.

A design approach to research problems can be seen as a process aimed at understanding a situation based on the human experience it creates. Dewey (2005) regarded the aesthetic aspects of design as profoundly affecting the practice of living and being in the world. In this, I concur with his notion of the experience of a built environment as grounds for appraising whether it is a suitable piece of architecture or a good workplace for that matter. Likewise, I consider that the experience of an artefact should correspond to the question of whether it can be considered as a good design. In exploring *phronesis*, I follow Dewey's proposition of studying what makes sense, what creates an experience. He stated that sense covers a wide range of contents, everything from the sensory, the sensational, the sensitive, the sensible, and the sentimental to the sensuous, that is, the meaning of things present in immediate experience.

A reflective approach illustrates the possibility to contribute to change and innovation by challenging prevailing logic and considering various alternatives. Put differently, the reflective design practice involves a solution-oriented, explorative research process, as opposed to the more traditional rational problem-oriented approach originating from a given problem, and searching its solutions without questioning the foundation of that problem (Edeholt, 2004). A reflective approach to change and innovation might well start with an intervention intended to explore certain phenomena without a predetermined idea of what the research problems are or what the solution will be.

Schön (1983) discusses the '*reflective practitioner*' as possessing a quality of being able to listen what he refers to as the situation's 'backtalk'. This is exemplified as the designer skill of a *reflection-in-action*, in the sense of the consideration of consequences of various alternatives during action. Although not explicit in Schön's

portrayal, I consider that this can also be undertaken as listening to the 'backtalk' of people in a situation, originating from their experiences in collaborative exploration of certain phenomena in the search for something new and desirable. Accordingly, like Dewey (1938), I see a need for research that is originating from investigations of individual experiences, beginning in unspecified situations and proceeding towards creating valuable solutions. This involves for the researcher/designer to be able to reframe mind-set between ideation of solutions and reflection on implications of solutions in a continuous back and forth iteration.

Equally, Schön (1983) stresses the importance of 'the whole', the holistic experience of Gestalt<sup>10</sup> as the experience of parts combined to a synergetic entity. This experience can be disrupted at every change to any component, and hence "...the designer must oscillate between the unit and the total /.../ oscillate between involvement and detachment (1983 p. 102). In taking seriously the Gestalt principles, I propose that a technically rational problem-oriented process of dividing into sub problems that are solved separately risks leading to an outcome that fails to provide the synergetic effects of a unified whole experience.

An implication for a reflective design approach is Krippendorff's (1989) consideration of individuals being unable to explicitly express what they need in clear functional statements. Rather, people are interested in how the product makes sense to them. Understanding user experiences and values therefore necessitates understanding sense making on a more profound level than to simply be asking people what they want. In turn, this implies a return to Dewey's (2005) notion of the meaning of things present in immediate experiences. This means that experiences and values can be discovered through people taking action in some way.

This is relevant also to the description by van de Ven (1986) of the phenomena of individuals gradually adapting to circumstances and the environment and thus becoming indifferent, until a level is reached where only crisis can stimulate action. Coming out of such states of minds therefore requires a different approach. Often referred to as founder of Action Research, Lewin (1947) for this reason advised a stage of un-freezing, which he likened with a catharsis of breaking out of shells of indifference and prevailing logic before proceeding to change conditions. This is further discussed in up-coming sections.

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<sup>10</sup> Gestalt here refers to the human capability of creating a unity of different parts, that is, creating an experience that contributes with something more than the sum of each of the parts provide.

In summary, research problems in a reflective design approach emerge in an exploration of the problem setting, preferably in collaboration with the people of concern, and with emphasis on what gives value in a given context.

## **2.3 ACTION-BASED RESEARCH**

In this section I discuss action-based research. The reflective design research approach in the Future Factory project, although not a distinct action project, draws inspiration from Action Research and its various fields and methodologies. In particular, inspiration was drawn from the field of Participatory Design and some of the methods and procedures applied within this field. Common to all of the various action-based approaches is the combination of theory and practice, and the consequent difficulty of dividing research into distinct theoretical or methodological parts. In the following sections therefore, an intertwined practice theory is applied.

In design practice there is generally awareness of the action of performing design as the best approach for understanding design. This was also one of the reasons for the collaborative approach in the current research study, to make participants experience the performance of design as a way to build knowledge of alternative methods and solutions. A further outline follows of various action-based research approaches.

### **ACTION RESEARCH**

Action Research (AR) is a field that spans a wide variety of approaches and procedures, all consisting of research and actions undertaken to solve ‘real-world’ problems in participation with the people concerned. Lewin is often referred to as the founder of AR. I agree with his declaration that “...the best way to understand something is to try to change it” (in Greenwood & Levin, 2007 p.18). This also seems to be the core of AR, in the sense of taking action for change in collaboration with the people concerned and thereby building new scientific and pragmatic knowledge and understandings.

Lewin was a German-American psychologist particularly interested in social change, that is, how to conceptualize social

change and how to promote it. Whereas AR is not seen as a specific set of theories and methods, Svensson and Aagaard Nielsen (2006) describe the normative change, in problem solving, developmental work, or reconstruction as the main principle. In line with their ideas, I see another important characteristic in the joint learning that takes place in an action-based research process. The co-production of knowledge is interesting, since it refers to both researchers' development of scientific knowledge and practitioners' realization of alternative solutions.

The reason for pursuing action-based research hence is the ambition for alternative production of knowledge, the previously mentioned Mode II type. In contrast to the traditional Mode I type, this approach to knowledge production is said to have the objective of developing practical knowledge for specific situations, in collaboration with various actors (Novotny et al., 2001). Therefore, as Svensson et al. (2002) observe, it is a two-fold commitment to both studying a system and working on improvements with the people within the system.

Another principal of AR is the participation of actors in the research work. For example, Svensson and Aagaard Nielsen (2006) describe AR as a scientific method for pursuing research that particularly emphasises the link between theory and practice. In the AR approach, it therefore seems as if theory and practice blend in a way that contributes to both the researcher's and the practitioner's richer understanding of the situation. This can also be observed in the iterative process that is applied in many action-based research projects, consisting of iterations between planning, acting, and reflecting, see Figure 2.

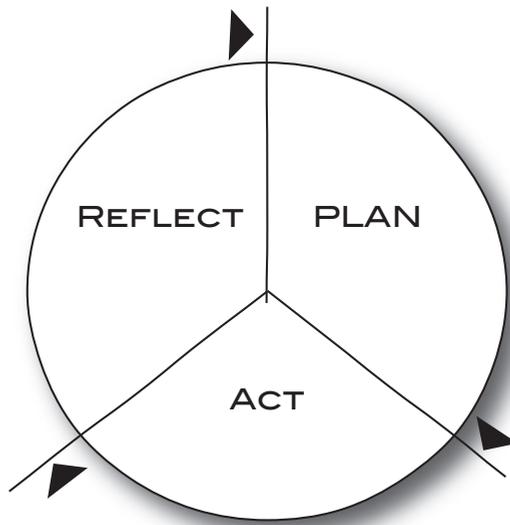


Figure 2. A model for action-based research practice.

## **SOCIAL ENGINEERING**

As mentioned, Lewin is often referred to as founder of AR. The strength of his ideas is in my view his ability to move focus from the environment, system or technology that is to be changed, developed or innovated, to the human experience of change and new thinking. Hence, his motive was that technological development did not include understanding of basic human imperatives. In *Action research and minority problems* (1948), Lewin discusses how to approach change and thinking innovatively. In this, he notes:

“The research needed for social practice can best be characterized as a research for social management, or social engineering. It is a type of action research, comparative research on the conditions and effects of various forms of social action, and research leading to social action.” (Lewin, 1948 p.35)

I comprehend Lewin’s notion of ‘social engineering’, as a proposal of a combination of a social and natural science perspective in a solution-oriented pragmatic approach. Like Bargal (2006), I consider the adaptation of the term engineering to suggest that he did recognize engineering as an applied profession with knowledge and practice for change and development. Lewin (1948) states that a new research paradigm of social engineering will include the whole range of descriptive fact-finding and both laboratory and

field experiments in social change. My reflection of this is that he could conceivably have applied the term design today. As I consider design research, it is a field of practical theory that can be positioned in between and overlapping the fields of social and natural sciences.

Practical research, action research, in Lewin's (1948) view requires a different type of knowledge consisting of both general theories and context-dependent analysis of a specific situation. General laws can thus serve as guidance, but to take action requires knowledge of the situated context. In this, Lewin also acknowledges the Gestalt theory principle of realizing and considering correlations between the whole situation and its various parts. Such knowledge cannot be generalized, as it depends on the specific character of the situation. This is in my view similar to notions within the field of design.

Therefore, I also agree with Lewin's proposal that all processes that involve humans should always derive from the relation between the individual in a specific situation and the whole system to which the individual belongs. Fact-finding through surveys or other rational approaches does not tell anything of group relations, norms and cultures. Therefore, the activity of analysing a situation, in Lewin's view involves questioning the problem and the various alternatives. It can also involve changing the whole overall plan. In my view it involves all of the aforementioned concepts of knowledge building through *episteme*, *techne*, and *phronesis*; to explore why, to explore or create how, and to build knowledge through experiences and values of the specific situation.

In summary, I would say that Lewin's concept of social engineering involves the understanding of analysing a situation means to intervene in the actual practice and consider the relations between the individual and the group, the work task, the organisation, the technology, and the work environment.

## **RESEARCH PARTICIPANTS**

The current research was built around collaboration with various actors in exploration of future visions of industrial work and workplaces. Like Ehn (1988), I see the reason for involving everyday people in design activities, as to emphasise the social properties of design and thereby to rethink the prevailing boundaries of rationalistic formalized processes. This is relevant because of the previously mentioned research intention to question,

challenge and even provoke the bounded technical rationality within the industrial sector.

In parallel with Ehn's proposal of moving beyond the strongly embedded Cartesian mind-body dualism<sup>11</sup>, the current research study's incentive was for more creative ways of thinking innovatively, and above all experiencing, the performance of design. An action-based research approach, Ehn argues, "...results in a kind of knowledge which elucidates and widens the range of possible action" (p.40). For this reason, a participatory research approach can be seen as relevant in the current research study, to explore with the participating actors alternative ways of work and workplace design.

Another reason for involving participants in research is the mutual learning that Greenbaum and Kyng (1991) see as a vital aspect in collaborative processes. This can be seen as an exchange of knowledge, in which the researcher contributes something and the practitioners give something in return. What this something is depends on context, situation and participants. Ideally, the exchange should be balanced, so that researchers and participants feel that they have both contributed and gained from the participation.

The purpose of collaboration is hence to take action in the interventions, not just be represented in committees or in meetings, but to cooperate on equal terms. Like Arnstein (1969), I consider there to be various understanding of what collaboration is compared to, for example, representation. He discusses participation from the perspective of who is participating and in what. This ranges from informing some interested party about what is going on, to full control of the process. This is relevant here because the collaboration of otherwise uninvolved people in research should in an action-based research project be based on both researchers' interests and participants' needs. This is central to AR.

I agree with Löwgren and Stolterman (1999), when they declare that the result of a design process is never better than the people who have been part of it. This is the reason for seeing the approach and the methods as tools that contribute to the

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<sup>11</sup> René Descartes (1595-1650) thought of the mind as distinct from the body. This was later referred to as the Cartesian mind-body dualism. The mind-body dualism involves the question of what is considered as knowledge, in the sense of the complex correlation between body and mind. (The Stanford Encyclopaedia of Philosophy [www.plato.stanford.edu](http://www.plato.stanford.edu) (2012-01-15))

development of participants' own collaborative and creative capabilities. A legitimate reason for involving stakeholders therefore can be the understanding and the recognition of humans' creative capabilities and the application of, and propagation for, non-formalized design approaches. Put differently, spreading a variety of experiences of performing design and thereby challenging the bounded rationality perspective.

## **PARTICIPATORY DESIGN**

Participatory Design (PD) is one of the many methodologies that are within the field of AR. It can be described as both an approach and an ideology, spanning a rich variety of theories, practices, analyses, and actions, as well as bringing together people from a broad variety of disciplines and practices.

Participatory Design was according to Ehn (1988) originally referred to as 'the collective research approach' or as the 'Scandinavian approach'. The former term illustrates the link to action research, although it is a description that restricts the field to research, to which, Ehn stresses, PD is not limited. The term 'the Scandinavian approach' refers to the original approach being developed in Norway, Sweden and Denmark, with a commitment to both workplace and systems design and workers' knowledge and ideas.

Like Muller et al. (1993) I consider the core idea of PD as working directly with users in design. The questions explored within PD originally dealt with socio-technical issues such as people's working conditions being less important than cutting-edge technology, and the possibility of increased productivity in combination with human growth, challenges in work tasks, and a high quality of working life (Muller et al., 1993). As Suchman (1993) puts it, it constitutes an emphasis on interaction and collaborations between those involved in *performing* design and those involved in *using* design.

Besides the foundation in AR, an original PD inspiration therefore appears to be the socio-technical systems approach as described for example by Trist (1981). In this, the social properties of work and technology are seen as being of equal importance as the technical. This was the also the motive behind the well-known Norwegian 'Industrial Democracy' project in the 1960s (Thorsrud & Emery, 1964; Emery et al., 1969) that seems to have served as something of a model for many other projects. An additional example is action-based design research work within the Swedish

food industry during the 1970s (Steen & Ullmark, 1979; 1982; Ullmark et al., 1986). The ideological base was here that planning and designs of work environments ought to involve the people concerned. The PD approach was applied in seminal project UTOPIA in the 1980s (e.g. Ehn, 1988; Greenbaum & Kyng, 1991; Bødker et al., 2000; Gunnarsson, 2007; Sundblad, 2009). The objective of the Utopia project was worker participation in developing new technology, and influencing work organizations at local level (Ehn, 1988). Utopia can be considered as a social innovation, as it involved both developing radically new technology for graphical work, and developing new meaningful work practice.

Sandberg, one of the research participants in the UTOPIA project, later participated in the socio-technical inspired design of Volvo Car Corporation's Uddevalla plant in the 1980s (e.g. Sandberg, 2007). In the late 1980s and early 1990s, the Danish 'Industry and Happiness' project was carried out as a social innovation through the use of Future Workshop methodology (Aagaard Nielsen & Svensson, 2006; Drewes Nielsen, 2006). In this project, the objective was of developing new work practice in Danish food industry through worker participation. At approximately the same time, the Danish POSTI and the European SPRING projects dealt with workplace learning with a PD approach (Binder, 1995).

An important aspect in this list of a few of the many preceding PD projects is the observation of the methodological sophistication that Ehn (2007) considers have emerged over the years. This can be exemplified as a greater focus and emphasis on the user's context. For example, in the annual User's Award, employees at workplaces all over Sweden nominate IT systems that they have found particularly valuable. Another example is the KLIV project, in which equipment for knowledge-transfer in healthcare usage was developed (e.g. Björgvinsson, 2007) and the ITQ project on simulation as a tool for day-to-day planning (Walldius et al., 2009). An additional example of a participatory research approach is the work of Gunnarsson and Westberg (2007), in which strive was for increasing gender-awareness at a large Swedish institute.

The list of projects that have implemented what can be denoted as a Scandinavian action-based approach could be much longer. With this display, I want to illustrate some of the wide range of applications of action-based projects. It seems that today, action research in various forms has a broadened scope of everyday life issues. Action-based projects are used both within and outside academia, and is now used, evaluated and further developed with

no strict line between theory and practice in many domains. What seems to combine all variations of action-based approaches is the emphasis on collaboration and context in explorations and actions towards making a positive change.

## **2.4 RESEARCH- THROUGH-DESIGN**

In this section, the focus is on what research-through-design can involve. The collaborative explorative design approach applied in the current research can be said to be an example of such an approach. Christopher Frayling exemplifies this as, for example “...development work ... for example customizing a piece of technology to do something no one had considered before, and communicating the results”. Or: “... Action Research ... where a research diary tells in a step-by-step way, of a practical experiment in the studios, and the resulting report aims to contextualize it” (1993 p. 5).

Whereas Frayling discusses research-through-design as resulting in an artefact, the current research study included probing change by design. Hence, the major difference is that the Future Factory project did not result in a physical outcome, however, the process of design was undertaken in similar ways such as thinking of alternative solutions for work and workplaces.

In the current research study, I strove to perform development work with a variety of interest groups, in order to challenge the prevailing rationality in the design of work and workplace. The current thesis therefore illustrates my ambitions to contextualize research-through-design in non-traditional design context.

### **DESIGN RESEARCH AS KNOWLEDGE PRODUCTION**

Design is a transcendental concept that seems difficult to grasp, despite the aforementioned efforts to uncover its foundation and systemize the design process in technical rationality approaches. However, there still exists neither a single definition of design, nor a single design practice, which may be reasons for the challenge of defining design.

Furthermore, as Buchanan (1992) contends, "...design continues to expand in its meanings and connections, revealing unexpected dimensions in practice as well as in understanding" (1992 p.5). Buchanan observes that during the 20<sup>th</sup> century design has expanded from being the vocational activity of a few to being an established profession, merging growing business and technical interest and research into what he refers to as a new art of technical culture. Like Buchanan, I suggest that design could be the link between research and practice in numerous ways. As Buchanan states:

"Without integrative disciplines of understanding, communication, and action, there is little hope of sensibly extending knowledge beyond the library or laboratory in order to serve the purpose of enriching human life" (Buchanan, 1992 p.6)

This is however not new, Gropius, one of the founders of Bauhaus<sup>12</sup>, had similar ideas of realizing a new discipline that was to be all-embracing in its scope. "...The guiding principle", he meant, "...was that design is neither an intellectual nor a material affair, but simply an integral part of the stuff of our life, necessary for everyone in a civilized society" (Gropius, 1956 p.7). Likewise, Dewey (1929) discusses art and science as two interrelated practices engaged in change. As he states on this topic:

"It would then be seen that science is an art, that art is practice, and that the only distinction worth drawing is not between practice and theory, but between those modes of practice that are not intelligent, not inherently and immediately enjoyable, and those which are full of meanings" (Dewey, 1929 p.358)

Traditionally, there is a distinction between science and art, as two contrasting practices. However, in the above quotation of Dewey, science is said to be an art and art is said to be a practice. Hence, what sometimes is seen as a distinction between art, as the non-rational work of a lone creative genius, and science, as the application of clear and rational methods and practices in the development of theory, cannot be drawn. Design can be seen as a practice that is in between art and science, as it involves creative, pragmatic and theoretical practices. If the term art is replaced with the term design, Dewey's intention can be understood as the

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<sup>12</sup> Bauhaus was a school in Germany (1919-1933) that had a for the time groundbreaking approach to design in the combination of crafts and fine arts.

proposal of a new practical theory building on meaning and experience.

To do so would of course require understanding of what Dewey's intentions were with the concept of art. Dewey (2005) states that works of art are often identified as buildings, paintings, or books that are separated from human experience. Like Dewey, I find that this distinguishes products (as in design outcomes) from use situations and the consequences they cause in human experiences and meaning. Dewey argues for the actual work of art being what the end product does for the user and how the people that are using the product experience it. Such an understanding of art can therefore coincide with a contemporary understanding of a reflective design practicum, as a new science and practice directed towards enriching human lives.

Elsewhere, Dewey (1944) argues that the scientific revolution was the transformation from empirical into experimental thinking. This change, he concludes, was accomplished by adapting knowledge from industrial crafts, thereby deliberately inventing a practice-based research form. The problem, he argues, and I agree, is that this is still not recognized in some traditional scientific practices.

A summary of those ideas can therefore be that design is ubiquitous, meaning that design plays a significant part in shaping human experiences and lives in numerous ways. Design can also be reconsidered as practice-based change with the intention of betterment based on human value. Perhaps this was also Simon's intention in saying:

"Everyone designs who devises courses of action aimed at changing existing situations into preferred ones" (Simon, 1996 p. 111)

As previously noted, I do not agree with certain aspects in Simon's proposal of the science of the artificial, that is, design. Nevertheless, I see reasons for spreading design understandings. Similarly, Nelson and Stolterman describe design as a principal human "...will for continuous improvement and development" (2003 p.11). According to them, the human motivation for betterment of the world is a basic desire to participate in the creation, or as they phrase it; "we want to make the world our world" (2003 p. 11).

In summary, design research can involve knowledge production of what contributes to value and what provides positive experiences in specific situations. Design involves improvement of some areas of life, for oneself or for others, for the community or for

the earth, in one way or another, either on a large or small scale. Therefore, design research can be seen to include developing knowledge of what contributes to making a positive change.

## **2.5 RESEARCH QUALITY**

In this section, I discuss various aspects of research quality. A traditional way of considering research is that it should somehow provide something new, and add to existing knowledge. On the other hand, it is not clear what new means, and how new, in relation to what, and who should judge it as new or not. The current research study can for example be considered as a new research design, due to the experimental probing of change by design. However, from a design perspective, it is probably considered as a fairly common design practice of thinking innovatively and exploring design space, although with somewhat different focus. Also, new research designs often seem to be regarded rather suspiciously from the viewpoint of traditional research fields. This is further discussed in the following sections.

### **QUALITATIVE RESEARCH**

Research practice can be distinguished as qualitative, quantitative or a combination of both methods. Denzin and Lincoln (2000) characterizes qualitative research as having emphasis for socially constructed realities and as answering questions of, for example, how experience is created and given meaning. Quantitative research, on the other hand, is by them distinguished as having an emphasis on value-free measurements and relationships between variables.

The strength of qualitative data can be the holistic research approach to a certain situation or context. For example, like Miles and Huberman (1994), I argue for the potential of making new discoveries through the holistic search for correlations, and perceived meaning and experiences.

I consider qualitative research to concern with context-dependent and situated aspects, that is, a search to understand certain phenomena. To exemplify this, the background of the current study was young people opting out of, and women

employees being in minority in, industrial work. In my view, those issues can be statistically researched, but to understand the underlying factors of why this is the case, and foremost to understand how to take action for change, requires a qualitative approach. Therefore, I consider the choice of a qualitative research method as the most obvious choice, due to the current study's emphasis on experiences, correlations, and values.

## RESEARCH VALIDITY

In general, a thesis involves discussions of research quality through validation. Research validation usually involves the arguments, the points of view, the practices and the skills involved in providing an account of the research study.

Validity can also have different meanings, for example, as Lindhult (2008) states, a *scientific* validity can be the application of valid theories, and the implementation of valid methods for the research objectives, and in the presentation of valid succeeding knowledge claims. A *pragmatic* validity can also involve effective solutions for practice, in the sense of providing conclusions that are useful and practical, and a *normative* validity can be the researcher's aim for improvements of some part. The meaning of this is in my view to describe a coherent line of argument to support the actions taken.

Dewey however discusses the practical difficulties of a social inquiry being judged by physical inquiry standards:

"The ideal of the knowledge dealing with the former (physical) facts is the elimination of all factors dependent upon distinctively human response. "Fact", physically speaking, is the ultimate residue after human purposes; desires, emotions, ideas and ideals have been systematically excluded. A social "fact", on the other hand, is a concretion in external form of precisely these human factors." (Dewey, 1998b p. 369)

Reflective design research in my view deals with human experienced realities and meaning. It can be seen as the combination of the formerly mentioned aspects of knowledge building through *episteme*, *techne*, and *phronesis*. I consider this to involve a search to know why (explore phenomena), to know how (explore context and methods), and to know who and to know what (explore and integrate the knowledge, experiences and values held by the people concerned).

## ALTERNATIVE KNOWLEDGE PRODUCTION

Like Novotny et al. (2001), I therefore consider that there cannot in action-based design research be traditional epistemological claims for *reliability*. Reliability generally involves a search for objectivity and reproducibility. In contrast, a qualitative design research approach involves explorations of experiences, needs, requirements and values held by people in specific situations. Such understandings cannot be reproduced, that is, if the same study is done with other people in another context, the outcome will most likely not be the same.

Novotny et al. (2001) propose the concept of '*social robustness*' as an alternative to reliability. To describe this concept they use the analogy of a building;

"The strength of a building depends on a wide range of factors - its construction materials and methods, its physical environment, its social use and so on" (2001 p.167).

As with any context-dependent practice, the building can in this view only be considered based on the construction method used for this particular building, the specific material used, the physical environment it is in, and the experience of the whole state held by the people that are using this building. This is what they refer to as social robustness, that is, knowledge developed for, and functional within, a specific context.

I agree with Novotny et al. that there is a distinction between robustness of knowledge and acceptance among individuals, groups or society. However, in a prospective quest, a short-term acceptance is in my sense rather difficult to fulfil since it involves unsettlement of previous stable states. To break stable states here means acceptance of alternative ways of pursuing knowledge productions.

The experimental Future Factory project is, difficult to qualify by any traditional standards. I did not have a 'building', in the sense of one specific workplace, and I do not know whether the research participants will apply the knowledge and understanding in their own various businesses. Instead, the aim was to build new knowledge of, and methods for, work and workplace design that emphasises human experience and value. The context was the whole Swedish industrial sector and the aim was to develop guidelines and methods that support experience and values as grounds for work and workplace design. Like Jungk (1987) I see a

necessity for such social innovations that break conventions and contribute to a development of practice in a striving for thinking innovatively. I agree with his statement that a social innovation is determined by factors that cannot be judged accurately or planned in advanced, but are equally necessary for growth and change.

Herr and Anderson (2005) discuss various alternatives for judging action-based research. For example, they describe *outcome validity* as the achievement of action-oriented outcomes. This can be used to describe the objective of the current research to contribute with methods and guidelines for work and workplace design. They further describe *catalytic validity* as the education of both researcher and participants. In the current study, the ambition was of co-learning design labs. Herr and Andersson describe *democratic validity* as results that are relevant to the local setting. For the Future Factory project, this can apply for results that are relevant for the whole industrial sector. *Process validity* is in this view the application of sound and appropriate research methodology in the generation of new knowledge. In the current study, this can be applied for the search for methods and procedures that best could support a collaborative knowledge production.

In summary, the experimental research through design applied in the current study, involves an alternative knowledge production that can be useful for developing knowledge of new phenomena. For the above-mentioned reason, I strive to provide an account of methods used and actions taken, and relate this to both theory and practice, in order to validate the process of the current study.

# 3 FRAME OF REFERENCE

In this part of the thesis the theoretical frame of reference applied in the current research is outlined. This involves an initial discussion on change, as various theories of what change involves and how it can be approached. Thereafter I describe the concept of design, and how it can relate to the current study. Gender theories were implemented in the Future Factory project, and how these can relate to design and change is further described in the upcoming sections.



## 3.1 CHANGE

As the focus of this thesis is change by design, it seems central to begin this section by detailing some theories of change. Although long gone, Lewin still influences development of theory and practice of change and will therefore take considerable space in this section.

Lewin once stated that there is nothing as practical as a good theory (1951). This statement illustrates the imperative of action-based research, in the sense of research that supports practice with knowledge of how to approach and solve practical problems. I additionally emphasise his framework for change as guidance for thinking innovatively, as well as for understanding the relevance of human experiences and values in the process of change. I follow similar reasoning regarding how to approach change in the interventions of, as Lewin (1947) stated; 'doing something with' rather than 'looking at' the people concerned.

### GESTALT THEORY

In design theory, Gestalt is generally seen as a coherent whole considered holding different characteristics than the sum of each of the parts. This can be illustrated as the experience of a painting involving a different experience than is provided by the sum of each of its parts, such as the various paints, the canvas and the picture frame. Although perceptions of a painting may be different between individuals, most people watching a painting experience something different than the single parts would provide if put in a large pile. The relevance of Gestalt theory therefore concerns the factor, so fundamentally important for the practice of design, of synergetic effects between various parts that can equally be applied for a painting, a building, a product, an organisation, or a work team.

Lewin for example, developed his field theory of change and group behaviour based on his notion of Gestalt theory. Lewin's field theory (1951) draws on the work of Cassirer, as can be recognized by its origins in the Gestalt principles. Gestalt principles in design generally relates to various human capabilities of, for example, experiencing a unity of shapes and forms. For Lewin, the Gestalt theory involves the understanding of the social space as relevant to an individual's experience and behaviour in the life world. This is significant in order to realize his ideas of change, to understand his notion of the individual in relation to the whole work system. The

parts is in this view also relevant to the whole, for example, these can be performing a specific task, with particular technology or equipment, in a particular organisation, in a specific context or work environment, see Figure 3.

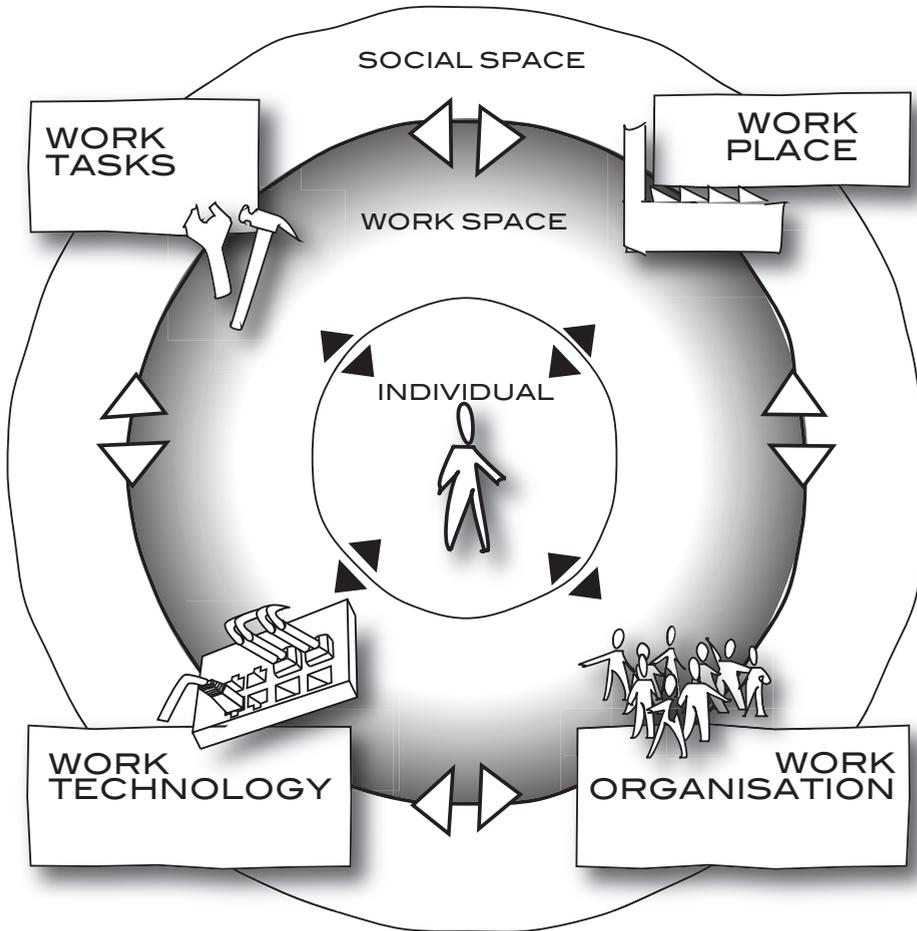


Figure 3. An individual in a work system consisting of work tasks, workplace, work technology, and work organisation, and its correlations in between and in relation to internal and external social space.

Lewin was interested in the aspect, at the time controversial, that human behaviour relates both to the individual characteristics and the social space s/he is in. The now-established idea of ‘group climate’ was not accepted in the mid-1940s. Lewin possibly therefore felt the need to argue that “...there is no more magic behind the fact that groups have properties of their own, which are different from the properties of their sub-groups or their individual

members” (1947 p.8). Like Lewin, I consider that an analysis of a situation therefore should concern the situation as a whole, the context, the relation to the individual, and the specific established characteristics, such as norms, values, attitudes, standards and practices, within for example a work team.

The Gestalt theory is often acknowledged within a system approach. In a similar way, Rickards (1985) discusses a system approach to innovation addressing the whole system, its parts, and the way the parts influence each other. This is also expressed in his statement on action research being a belief system and an approach to studying and changing a social system, like for example a particular organisation. In applying such ideology to innovation, Rickards states that social systems have ‘constructed realities’, and therefore there is a need for different approaches to thinking innovatively. Lewin’s application of Gestalt theory is to conduct a process of change as step-by-step iterations from the parts to the whole, and thereby avoid the danger of simplification to a specific problem without understanding the origin of the problem.

## **REFLECTION AS ACTION**

Most literature and consulting practice on work and workplace change involves first analysing a system and then recommending what actions to take. However, Lewin (1947) proposes that one cannot understand a situation without trying to change it.

Dewey is also relevant in this respect, having spent a great deal of time exploring human nature, for example, resulting in the concept of ‘learning by doing’ (2008). This involves the analysis of a situation as a learning situation that can provide both knowledge and understanding. According to Dewey (1998c), there is no best approach for addressing complex situations. Action, he states, means being involved in reflections on things formerly done as matter of course. Therefore, he stresses encouraging people to reflect on unreflective actions.

Dewey’s notion of reflective thinking is described as “turning a subject over in the mind and giving it serious and consecutive consideration” (1998a p.3). Dewey considered reflection as considering various alternatives. Reflection is hence described as an evaluation of alternatives courses of action, an activity that can be referred to as a reflection *for* action. Dewey stated that experiences change and transform by taking action, that is, after reflection on various experiences and alternative solutions, he considered that a learning experience occurred. This action also involves a

reconstruction of experiences, as he states that prejudice and stereotypes that distort experience will be revealed through serious reflection (1998c). I understand this to involve various interrelations that affect people's experience of a situation. In Dewey's view reflection therefore involves to disconnect from traditional understandings, in short, to reframe mind-sets. This is relevant as Dewey (1998a) suggests that individuals in everyday interactions experience things as the rational way of doing things. Most of the time individuals are not aware of over-arching 'framework of rules', or the prevailing logics that governs actions. For that reason there is a need to start by reflecting on norms and the situated context. Standing outside and studying people for this reason cannot provide sufficient knowledge compared to being in the middle of a situation.

Relevant in this respect is also Haraway's (1997) notion of diffraction. According to her, in reflection people tend to see a mirrored reflection of their own understandings. Therefore, it is necessary to activate alternative understandings of a situation. Haraway uses the metaphor of diffraction, which I interpret as rays of light hitting a rough surface and spreading in various directions. As I understand it, the rougher the surface, the greater the distribution of the rays. Converted to processes of thinking innovatively, this could indicate that the greater the diversity in the group, and hence the probable spectrum of perspectives involved, the more alternative solutions there can be, see Figure 4. If the incident light (understandings prior to change intervention) hits a smooth even surface (like-minded people, no challenge of subjective understandings), the reflection mirrors similar ways of doing things and similar solutions as before. In theory, if people in a change intervention are confronted with other perspectives and have to seriously re-consider their own understandings, alternative solutions and ways of doing things might appear.

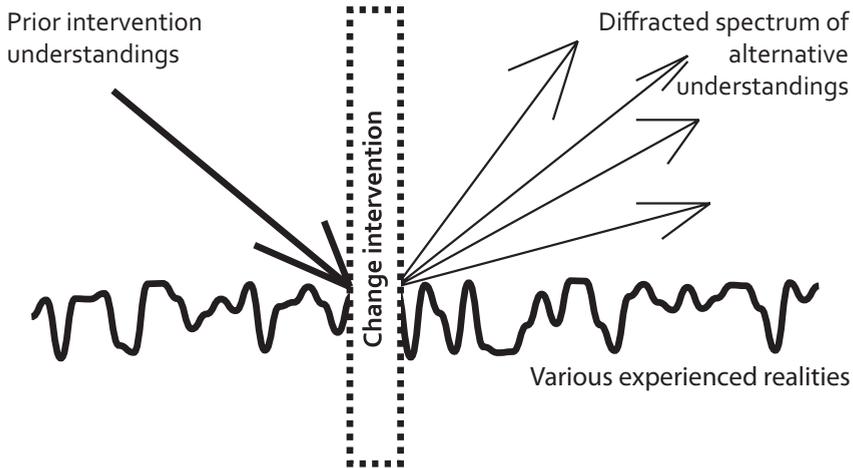


Figure 4. An interpretation of the concept of 'diffraction' as a group process of understanding various experiences and values, and thereby stimulates thinking innovatively.

In summary, as I understand the meaning of reflection, it means pointing out situations that require further exploration, although change can only happen if the people involved are able to reframe their understanding, through serious reflection as Dewey states, or by diffraction as Haraway argues.

## **ACTION THEORY**

Schön was influenced by Dewey's ideology, possibly due to his doctorate studies on Dewey's work, which may explain the close association between their theories.

Together with Argyris, Schön developed both theories and practices for action and change. For example Argyris and Schön's (1975) action theory describes the difference and relevance of implicit and explicit knowledge. This is described as when someone is asked how s/he would behave under certain circumstances; the answer usually gives the '*espoused theory*' of action for that situation (Argyris & Schön, 1975 p.6). Whereas this is the theory of action that people usually give based on un-reflected actions, the theory that effectively governs actions is in this view the '*theory-in-use*'. Thus, understanding relations and behaviour in a certain situation cannot consist simply of asking people. According to them, observations of behaviours give additional information about assumptions about self, others, the situation, and the correlations between the individual and the situation as a whole.

Schön (1983) discusses *implicit* knowledge as the kind of knowledge people possess for doing something by routine and intuition. This is referred to as *knowing in action*, in the sense of implicit knowledge being based on un-reflected actions. It can be exemplified by the action of riding a bike. Once you have learned to ride the bike it is for most people difficult to verbalize the actions that have to be undertaken in order to ride the bike, hence it becomes a mindless and intuitive action conducted without thinking about how each step is done. This can also be referred to as an *embodied* knowledge, the kind of knowledge that seems to be embedded in our bodies and that support some actions. Schön for this reason proposed to put aside the mode of technical rationality, which leads to the idea of only explicit knowledge existing. Instead, he argues, knowledge is in the actions:

“A child who has learned to throw a ball makes immediate judgments of distance which he coordinates, tacitly, with the feeling of bodily movements involved in the act of throwing. /.../ Similarly, we are able to execute, spontaneously, each complex performance as crawling, walking, riding a bicycle, juggling, without having to describe in words the actions we are carrying out, and often without being able to give a verbal description even approximately faithful to our performance” (Schön, 1985 p.23)

These activities that Schön refers to are learned through *reflection-in-action*. With his words, this involves thinking, that is, to consider what is going on in the moment, and doing, that is, taking action for change through, for example, coordinating the body, in order to perform the action better. Although I have heard stories about dry swimming at the beach before actually hitting the water, I concur with the notion that doing, that is, taking action as the best way to learn most practices. If a person after swimming were asked how s/he performs the act of swimming, the explanation would according to Schön involve a *reflection-on-action*. This kind of reflection is described as scrutinizing the action and, if possible, passing on the implicit knowledge that the action involves.

Schön (1985) discusses both reflection-in-action and reflection-on-action, as serious considerations that contributes to transform implicit behaviour and understandings into explicit knowledge and actions. In this view, reflection also involves consideration of understandings that has been implicit in the action, understanding that ought to be surfaced, criticized, and restructured before further action (Schön, 1983 p. 50).

However, whereas Schön stresses the necessity for individual reflection undertaken by people that do the same task over a long

period of time, and hence might miss out on opportunities of correcting errors, I do not necessarily agree. The mistake in this view is to lay the responsibility on the individual rather than supporting an innovative culture that nurtures continuous reflection and learning in a creative climate. For this reason, I consider it important to instigate a *reflection-for-action*, a preparation for change, development and innovation that brings attention to various notions of the situation in a continuous improvement process.

There are various methods and techniques for exploring context and certain phenomena. Lewin (1947) suggested observations and interviews in what he referred to as laboratory and field experiments of change. Argyris and Schön discuss observations. Sleeswijk-Visser (2009) mentions workshops as generative sessions that bring attention to implicit or latent knowledge. This is relevant, not least for a practice of design, as human experience and behaviour often are expressed without serious consideration. Some methods based on Argyris and Schön (1975), Schön (1983), and Sleeswijk-Visser (2009) are presented in Figure 5.

	People:	Technique:	Knowledge:
Espoused theory  Theory-in-use	Say	Interviews	Explicit
	Think		
	Do	Observations	Embodied
	Use		
	Know	Participatory inquiry	Tacit/Implicit
	Feel		
Dream	Workshops Generative sessions	Latent	

Figure 5. Various techniques for exploring experiences, values, and correlations.

## **A FRAMEWORK FOR CHANGE**

Lewin (1947) illustrates a change process as a three-stage model. This framework for change holds an illuminating terminology for the need to reframe mind-sets, as is illustrated in the stages of unfreezing, moving and re-freezing. Thus, he demonstrates the need for a reframing of current practices, logics, perceptions, and actions.

The notion of reframing might be understood as a tendency to impose change upon people, in the sense that people have 'incorrect' ideas or understandings that should be changed. As I understand Lewin's intention, reframing or restructuring mind-sets does not involve correcting behaviour in a top-down manner. Rather, in my view it concerns widening awareness of alternatives and realization of consequences of un-reflected habits or practices.

## **STABILITY AND RESISTANCE TO CHANGE**

The stability of human behaviour is by Lewin (1951) referred to as a *'quasi-stationary equilibrium'* that involves both driving and restraining forces. I consider his notion of equilibrium to be one of the main principles in his theories, as change and innovative thinking are often discussed as if a stable situation exists. In contrast, Lewin (1947) uses the metaphor of a river to describe the dynamic properties of practice. Change is in accordance with this something that can be likened to either paddling upstream, thus being exposed to strong counterforces, or paddling downstream and thereby getting more power and speed. This is relevant to thinking innovatively as a process can begin in some emerging aspects and, through explorations, involve strengthening already implicit knowledge, understandings, needs and values.

According to Lewin (1951), it is impossible to predict group behaviour without taking into account group goals, group standards, group values, and the way a group 'sees' its own situation and those of other groups. The importance of this is in my view in the understanding that contextual aspects in combination with individual experiences and social space construct certain behaviour. This awareness of a social space is therefore important to understand in approaching work and workplace design. An implementation of this means that an exchange of people influences group behaviour, as does a change of environment.

In order for change to take place, Lewin considered it necessary to illustrate the relation between various aspects and the relation to the whole system, and thereby produce destabilization of the stable state. Therefore, driving change forward in a top-down

manner in this view meant to paddle upstream, which produces a counterforce to maintain the state of equilibrium. Change will take place if the restraining forces are removed, as there are often already driving forces within the system. Although, according to Lewin, restraining forces are often more difficult to identify as they involve both individual defence mechanisms, and embedded organisational norms and practices. In the following is an outline of the stages of unfreezing, moving and freezing.

## **UNFREEZING**

The unfreezing stage is a metaphor for the catharsis that Lewin considered necessary for a reframing of mind-sets through removing presumptions and assumptions. The first phase in the framework for change also appears to be the most difficult and the most important phase. As he stated:

"To break open the shell of complacency and self-righteousness it is sometimes necessary to bring about deliberately an emotional stir-up" (Lewin, 1947 p. 35)

The unfreezing involves highlighting what goes on in the existing state of 'what is'. According to Lewin, the whole change process should be thought of, not as a goal to be reached, but as a change from the current level to a desired one (1947 p.32).

This process can be likened with narrowing or widening riverbeds, removing obstacles like rocks, and so forth. Change involves breaking established customs or habits, as they are in Lewin's view seen as obstacles to change. The readiness or the motivation to break stable states according to Lewin depends on how much is 'invested' in them on an individual level and to the 'ethos', the total value system of the group. For example, if an individual diverges from an established group 'standards', s/he can generally experience some difficulties. Thus, according to Lewin, most people stay close to the 'standards' of the group they belong to, or wish to belong to.

Lewin exemplifies group standards as aspects of goals, values and the way a group see its own situation in relation to others. Conflict, therefore in this view, is concerned with different experiences of a situation existing at a given time. This means that analysis of a given situation includes moving from the life space of the group, to the whole situation space and back again to affect the group's life space. This also illustrates the influence of Gestalt theory, as it involves to consider the parts in relation to the whole.

As I understand it, the unfreezing stage concerns what Schein (1996) discusses as 'survival anxiety', in the sense that each individual and group must overcome the anxiety of change, and overcome the idea that change means that the current practice is wrong or incorrect. This belief is the most difficult to overcome, as Schein thinks that most humans need to assume that they are doing their best. Change therefore in this view involves loss of effectiveness, self-esteem or even individual identity. This is the reason that Schein sees for poor adaptation to imposed change or failure to meet our creative potential being more desirable than risking failure or loss of identity in a learning process.

Brown (2008) has similar lines of reasoning in discussing the politics of new ideas. Innovations, he states, "...threaten to cannibalize previous successes and recast yesterday's innovators as today's conservatives" (2008 p.136-137). Therefore, it is difficult to establish a change culture as a motivation and willingness to think innovatively. It takes resources from other investments within an organisation and can therefore create discord. It makes the employees' and managers' situation more difficult as they have to do things differently, often without knowing the risks in advance. Therefore, as Lewin understood it, it is vital to identify those fears and spotlight them, thereby creating psychological security. This is also similar to Jungk's (1987) discussion of social experiments of change as a way to reduce apprehension of change, hence to reduce the survival anxiety by involving people in probing change.

## **MOVING**

In Lewin's model, the second stage of moving, involves trial and error evaluation of alternative solutions. According to Lewin (1947) motivation to change is not enough. The restructuring of situations also concerns the ability to change. Not all people have the ability to influence their own situation. This is probably the reason for Lewin's argument that it is easier to change a group than to change an individual. The relevance here is in the group as the basis for where it is considered acceptable to change mind-sets.

To change means to highlight the standards and explore and develop alternative solutions that are socially acceptable. He further discusses the approach of moving from separate analysis of the life space of each group to that of the total social space, and back again, in order to reframe group members' understandings (Lewin, 1947 p. 12), as he asserts that:

“The forces always depend on the characteristics of the group or the individual in question and on his relation to the surroundings” (Lewin, 1947 p. 23)

Schein (1996) considers that this involves a semantic redefinition, to learn that words can have different meanings, as well as a cognitive broadening, to learn that a given concept can be much more broadly interpreted than assumed, and to develop new standards that have social value for the people of concern.

He exemplifies with teamwork, which is an often-used concept. Although, in the US the societal norms are that of “each human for him/her self”. Therefore it is according to Schein necessary to give motivation and opportunity to change the social standards. In this case by illustrating the individual benefits of seriously undertaking teamwork. He further exemplifies with a redefinition being possible through the understanding that the interpretation of a given concept can be different from one’s own. This means to ‘hear’ or to ‘see’ something from a new perspective, that is, to reframe mind-sets.

The search for new ways of doing things means exploration of various alternative solutions. Schein (1996) stresses to not be scanning for best practice since that might involve adapting strategies or solutions that do not fit in the workplace culture. Therefore, the strategies might only function temporarily. Likewise, benchmarking often adapts other company’s solutions without knowledge of how they were created. The consequence can be a circular process where firms implement solutions from each other’s businesses, which basically do not work anywhere.

## **FREEZING OR RE-BUILDING**

The third stage of Lewin’s model is freezing. In Lewin’s view, this means to stabilize the conditions at a desirable state. The main point of the refreezing phase seems to be to ensure that the reframing is stable, meaning that the individuals have accepted the semantic and cognitive re-configuration. This explains the term freezing, although, I consider the term re-building as a more suitable expression. The reason for this is that the new state is not stable, as it exists within a dynamic context, it in my view needs a continuous re-building.

For example, during his time at the Tavistock Institute, Lewin attempted to change wartime housewives’ habits into using other kinds of food than was at the time socially accepted. This could be established within a closed group, according to him however the

same reframing must take place in the community for the new behaviour to be lasting.

Lewin's model of change has relevance to a great variety of processes. As he stated himself: "production levels of a factory, a work-team and an individual worker; changes of abilities of an individual and of capacities of a country; group standards with and without cultural value; activities of one group and the interaction between groups, between individuals, and between individuals and groups" (1947 p. 39). The relevance for change and innovation is in my view as relevant today as ever before, as it basically concerns context-independent human conditions for change.

## **FUTURE WORKSHOPS AS 'FREE SPACE'**

In this section I describe the Future Workshop method and its relation to change. Jungk portrays Future Workshops as 'social innovations' (Jungk, 1987; Jungk & Müllert, 1989). When Jungk started with Future Workshops, the incentive was democratic, as he states, the meaning of 'demos' is people, and hence a democratic perspective means a human-centred approach. With this as motivation he developed an approach to initiate common critique of the existing and to create alternative proposals of what the future might be. In this, the idea of having collaborative interventions with a variety of actors involved is stated as something radically new and previously not known, and thereby as a social innovation.

Müllert (Jungk & Müllert, 1989) provides an illustrative notion of Future Workshops as probes, sent out into the everyday world with the intention of involving a broad variety of people in the exploration of various futures and how they can be created. The Future Workshop can hence be seen as a free space, a change intervention, in which people can discuss various desirable future scenarios.

The concept of free space concerns settings in which people are removed from the control of dominant groups or authorities, and in which they collaborate on a voluntary basis concerning certain issues (Poletta, 1999). The relevance of this for the current research is the notion that in a collaborative design space, which is formed with the intention of being somehow visionary or exploratory, people need to feel that they can criticize present states without risking reprimands.

The idea of a free space was in the current research work applied in a similar way to Schwencke's (2006) contention that the aim of a free space is to strengthen subjectivity, and thereby becoming more conscious to ambiguities, ideas, alternatives and possibilities in the 'real' world. I agree with her argument that this cannot happen in a space of pure rationality, rather, it depends on creating emotional experiences and critical reflections based on various perspectives (2006 p. 376).

Aagaard Nielsen and Svensson (2006) follow a similar line of argument in the state of social imaginations as a key concept for exploration of contradictions and ambivalences. Within action research, free spaces are therefore seen as arenas for social imagination that are easier to employ, and which are more productive, than is possible in the structure of everyday life situations. However, it is important to bear in mind the previous mentioned change that also have to take place within the community or within the workplace, in order for the change to be stable (Lewin, 1947).

Drewes Nielsen (2006) describes the Future Workshop methodology as originally a method for critical reflection, with the objective of challenging the dominant power structures and decision-making processes. This seems to be the reason for having a particular initial critique phase, to openly discuss and criticize implications of current practice.

In contrast with this, Ghaye (2007) proposes an appreciative participatory approach, in his emphasis on that work and workplaces should build on the notion of appreciating what is good and currently working, rather than criticizing what is not, such as voicing disapproval in the critical phases of Future Workshops. These can be seen as two contrasting approaches, one critical and one appreciative, but as I see it they can complement each other. In the Future Workshop approach, being critical means to be consistently negative (Jungk & Müllert, 1989). However, being critical can also involve questioning and challenging current procedures, and realizing alternative understandings and solutions in order to create learning, improvements, and/or innovations.

This is also exemplified in Westerlund's (2009) suggestion of considering a workshop as a process of co-operative learning. He states that actors in a workshop have the ability to both question and explore current practices, and therefore also explore each other's various understandings.

Another incentive for workshops as a practical theory for change is Brandt's (2005) proposal that workshops that include many

stakeholders in co-design activities have a strong impact on the organisations in terms of commitment to the issues. Creating commitment is generally seen as the most vital aspect for change to be possible. Schön (1973) argues that an experiment is an attempt to discover what it was in the intervention that produced the results, whether good or bad as "...negative results are as good as positive ones" (Schön, 1973 p. 213).

Thus, the reasons for undertaking a Future Workshop as a free space is that the experimental approach seems to include common learning, questioning and challenging of prevailing logics, commitment to issues, and the apprehension of fears and concerns, in the probing of change.

## 3.2 CHANGE BY DESIGN

In this section I elaborate on some design theories, as the current research objective is to explore change by design. Despite design being thoroughly integrated in human life worlds and a terminology in frequent everyday use, design is a rather vague and all-embracing concept. Although I do not have all the answers as to what design is, I here strive to contribute with some understanding and knowledge of design as a reflective practice.

Moreover, in proposing a design approach to change, the reflective design tradition that the current research work is based on involves a somewhat different research and design practice in relation to more traditional product and production development processes.

### THE CONCEPT OF DESIGN

In the broadest sense, there are no boundaries to what the concept of design is or could comprise, either as science or practice. Illustrating this argument is Ralph and Wand's (2009) identification of 19 various uses of the concept in research literature, ranging from the most common use of design as a *process* or a *creation* to less frequent use of design as a *resource* or as *optimizing*. Design is further described in literature as different objects; either as *systems*, as *artefacts* or as *processes*. It is described as both *physical* and *mental activities* and as *plans* and *solutions* (Ralph & Wand, 2009).

The wide usage of the concept of design illustrates the broad understanding and application of both the terminology and the practice. The following quotation illustrates this:

“Today, most people's lives would be unimaginable without design. It accompanies us from dawn till after dusk; at home, at work, in our leisure time, in education, in health services, in sports, in the transportation of people and goods, in the public sphere, everything is designed, intentionally or not” (Bürdek, 2005 p. 11)

In most Western societies, design therefore can be said to be ubiquitous, furtively integrated into human life worlds in numerous ways, both explicit and implicit. This integration of design in people's lives, therefore, in my view necessitates a need for understanding how design affects people's lives. That is, exploring

notions of various meanings and experiences, and fundamentally how design can contribute to improve everyday human lives.

Likewise, Mitchell (1993) refers to this by stating that the area of design is transferring subject from form to experience. This, he argues, calls for designers to change focus from the mass-produced artefacts of the industrial age to experiences, as part of the emerging knowledge economy. In a keynote speak from 2010, Buchanan in similar ways discusses the fundamental principle of design as a 'whole body experience'. In this, I concur with the criticism of dominant understandings of design interactions as being only between humans and material artefacts. When realizing that design interactions can involve all sort of situations, the focus shifts from the product or the technology itself to that of how people relate together, and how the various meanings and experiences can be represented in new forms that makes sense. Elsewhere, Buchanan (1998) discusses the changing character of design, and states a need for diversity and alternative perspectives in creating future visions, in order to avoid narrow rational thinking.

An open-minded alternative design approach can hence have a wide range of possible outcomes, such as products, services, environments, buildings, systems, organisations, and even new businesses. This is thought provoking, and distinguishes design from other practices.

## **A MIND-SET OF DESIGN**

In relation to the current research, some design processes dealing with change and development of work and workplaces in industrial contexts, in my view illustrate a provincial discourse of narrow thinking regarding efficiency and productivity. The dominant approach thus seems to hold a technical rationality perspective that excludes human experiences from the process, as a change process in general involves a few like-minded people collaborating on decisions, planning, and implementation (e.g. Bellgran & Säfsten, 2005; Johansson, 2009). In contrast, Buchanan (1998) states that:

*"The ultimate purpose or function of design is to conceive products which express and, necessarily, reconcile human values concerning what is good, useful, just and pleasurable. However, these terms no longer possess fixed and generally accepted meanings. Their meanings are the subject of our deliberations."* (Buchanan, 1998 p.11)

The importance of this argument is in my view the focus on the human values of what is good, useful, just and desirable. This

implicates a need to include a diversity of perspectives in the search for various meanings of value. In contrast, a focus on power and control of the design process through application of certain models or methods eliminates and abandons diversity and the search for alternative solutions. Buchanan (1998) therefore argues that the dilemma of contemporary design deals with the dominant ideal being that of rational and systematic processes.

The by Rittel and Webber (1973) previously mentioned suggestion of exploring both what is and what ought to be in my view therefore involves exploration of people's "whole body experience" of knowledge, needs and values, as well as questioning given problems and requirements in a particular design task. A reflective design approach to complex problems can therefore be seen as a process aimed at understanding a situation on the basis of the human experience it creates.

Relevant, in the respect of the design outcome as dependent on the applied ideology, are Edeholt's (2007) idealized design approaches, which he portrays as those of engineer, designer and artist. According to this view, the engineering ideology often involves rational and systematic problem solving of present states of "what is", the design ideology origins in future idealistic thinking of "how it ought to be", and the artist ideology often involves critical reflection over the provocation or challenge of status quo, as "why is". The, by Edeholt inspired, refined, and idealized design approaches are presented in Figure 6.

Discipline	Engineer	Artist	Designer
Mindset	"What is"	"Why is"	"What if?" "What could be"
Role description	A rational and realistic problem solver who in a scientific way works systematically from given problems to finished solutions	An intuitive and idealistic provocateur who assumes from a given problem and creates objects to think with, aiming for reflection without producing solutions	An intuitive and pragmatic questioner who assumes from how it ought to be, employs solutions to test, understands and reformulates given problems
Approach	Problem driven forecasting	Provocation driven back casting	Solution driven back casting
Outcomes	Optimized solutions	Critical reflections	Alternative solutions

Figure 6. A comparison of various mind-sets in design disciplines.

Although those idealized types should not be seen as descriptions of reality or stable states, I consider them to be interesting exploration of various mind-sets that exist both within practice and academia. In reality, I am certain there is no clear-cut distinction between the different role descriptions; it is probably the case that various phases of the design process require different approaches. Nevertheless, as an idealized thought figure, Edeholt's comparison is useful as a reflection on the idea that different ideological starting points may lead to different approaches and even different results.

## REFLECTIVE DESIGN PROCESSES

As previously mentioned, Jones (1977) argues for an abandonment of rationalistic systematic design methods, since there cannot be one all-embracing recipe for design. Design is in this view all about broad, dynamic and complex situations, which cannot be limited and stabilized in one single framework.

The design process can, for the above-mentioned reasons, be seen as an open-ended process including exploration of possible solutions. This, Westerlund (2009) proposes, involves searching boundaries of a 'design space'. He contends that design space exploration should initially be about being surprised. Subsequently, Westerlund considers that when knowledge has increased, the process becomes experimental, as solutions are created, explored, confirmed or rejected (2009 p.35).

Likewise, Schön's (1983; 1985) discusses a situation's 'back-talk' as necessary for understanding what is going on;

*"Together, uncertainty, uniqueness, value-conflict, make up what I call the indeterminate zones of practice. In these zones, competence takes on a new meaning. There is a demand for reflection, though turning to the surprising phenomena and, at the same time, back on itself to the spontaneous knowing-in-action that triggered surprise./.../ It has a critical function, questioning and challenging the assumptional basis of action, and a restructuring function, reshaping strategies, understanding of phenomena, and ways of framing problems." (Schön, 1985 pp. 25-26)*

The vital aspect in this quotation is in my view the critical function of challenging the narrow-minded perspectives of 'problems'. Schön's idea of indeterminate zones of practice contains the idea of exploring an initial broad context, as it is problematic to accept that a proposed problem is dependent on certain stated aspects.

He further considers designers to have unique open-minded capabilities, practised in the initial experimental approach of problem-setting rather than problem-solving. As Schön puts it:

*"It gives rises to experimenting /.../. It consists of actions that function in three ways, to test new understandings ("What is going on here"), to explore new phenomena ("What else looks odd here"), and to affirm or negate the moves by which the practitioner tries to change things for the better ("How can we get this under control?")/.../ In these instances, we can think of the inquirer moving in the situation, "talking back" to the inquirer, triggering a reframing of the problem, a re-understanding of what is going on. The entire process then has the quality of a reflective conversation with the situation" (Schön, 1985 pp. 25-26)*

This is a process that has a diametrically different basis than for example traditional problem-solving processes. This is also different from ergonomics and human factor practice, which also are said to have a one-sided focus on problem-solving, that is, the industrial age's all-embracing logic of increasing productivity and efficiency (Bannon, 1998).

In contrast to ideas of Scientific Management in the early 20<sup>th</sup> century, my understanding is that design processes cannot be simplified into one general context-independent approach. However, as suggested by Brown and Katz (2009), a design process can be seen as systems of overlapping spaces. Those spaces are by them referred to as *inspiration*, as the problem or opportunity ('proportunity') space that motivates the search for solutions; *ideation*, as the process of generating, developing and iteratively testing ideas and proposals; and *implementation*, as the finalization of the process, see Figure 7. I find these representations to be interesting because of the general characteristics that leave room for context dependency. Put differently, they provide a framework for the process that can be contextualised for specific situations and practices.

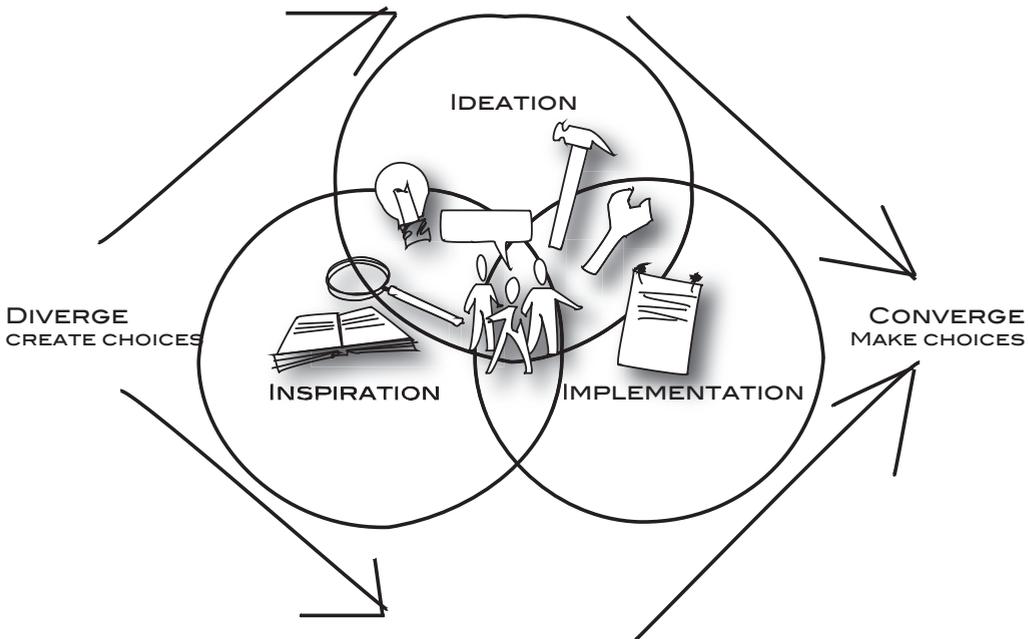


Figure 7. A model, open for context-dependent interpretations, for a design process consisting of inspiration, ideation and implementation.

A design approach to change through this framework could well start with an intervention intended to explore a certain phenomenon without a predetermined idea of what the solution will be about, in the design space explorations. Such a design approach is different in some important aspects that concern change and thinking innovatively. This difference is relevant, as in my perspective people need to be challenged or provoked in order to abandon established thought patterns for thinking innovatively.

## MEANING

In a design process that originates from people's experiences, meaning is fundamental and therefore something particular that I am elaborating. For example, there is a paradox of creating something significantly new and different from what is previously known, at the same time, as the outcome should 'make sense', in the meaning of being understood, used, and valued. The design objective of 'making sense of things' summarizes Krippendorff's (1989) assertions for design being a subject that deal with meaning through perception, experience and aesthetics.

The contradiction between creating something new and something that makes sense can in a Krippendorff approach be solved by understanding what gives meaning in a specific context, and by redefining that meaning into a new Gestalt. Thereby, the outcome has better prospects of being a desirable new, yet recognizable, entity. Meaning therefore is an important principle for design. As Krippendorff elsewhere states:

"Design concerns itself with the meanings artefacts can acquire to their users" (Krippendorff, 1995 p. 148)

More recently, Krippendorff (2011) discusses the move beyond the engineering of functional products into a true user-centred design. In this lies the proposal of a field of design that concerns with the multiple rationalities that people have and bring to use situations. Consequently, he states:

"Form should not follow function, but meaning, and design has to make sense to others". (Krippendorff, 2011 p. 413)

In acknowledging meaning as a primary principle, I agree with Krippendorff's (1995) reasoning of meaning fundamentally being about communicating through design. However, as he would

probably agree, it is fundamentally important to understand how people create meaning, that is, to be able to communicate meaning through design.

Furthermore, he states that this can in design practice not be about dwelling on existing 'facts', but about concerning ourselves with a multiplicity of perspectives in realizing new ideas. In short, design deals with human meaning.

For that reason, I concur with Krippendorff's statement that meanings are not entities that can be designed into machinery or attached to their surface by, for example, symbols. As I understand this, a neglect of recognition of human's interactions in design cannot produce outcomes that are meaningful to the users. For example, in general the engineering practice concerns with mechanical functions, and the marketing practice deals with statistical propensities for sale. The economists are concerned with accounting for costs, optimizing profits and maintaining growth. The ergonomists focus on human physiological and perceptual function under controlled conditions. This leaves for the practice of design to concern with meaning, that is, to create products, systems, environments, services, and so forth, which make sense.

Krippendorff efforts to make design fundamentally about making sense have given him a special position in design theory. However, meaning is concerned with more than perception and aesthetics, as he seems well aware of, it also deals with creating outcomes that are understandable and valuable for a variety of people. For example, Margolin (2007) discusses meaning as dealing with norms and practice. This implies more than user interface and product semantics, as it also deals with understanding people's fundamental values and the for a design practice fundamental implications of how to operationalize such knowledge.

An implication of meaning in design can be what Robinson and Bannon (1991) discuss as the problem of a distinction between the nature of a description and an interpretation. In this, I consider that an accepted abstraction of reality as 'true' can lead to serious difficulties. Interpretations at various levels may even lead to what Robinson and Bannon describe as no relationship between the ontology<sup>15</sup> and epistemology of the artefact and that of its intended use situation.

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<sup>15</sup> Ontology: here in the definition of a particular theory or ideology of what is considered as relevant to know within a specific group, for example, a particular profession (Definition of ontology: c.f. the Merriam-Webster dictionary [www.merriam-webster.com](http://www.merriam-webster.com)).

Somewhat simplified, in relation to the current project this can be exemplified through the following fictive story.

The employees at a workplace are experiencing some difficulties, which they consider would be solved through some kind of new equipment. They talk to their managers and verbalize their needs. The management board interpret what they think 'actually' is needed, feasible and economically viable, hence, limits the solution space. Legislation and requirements further restrict the solution possibilities. Another party makes a list of requirements, which involves interpreting the needs into measurable data. The list is handed to a designer, who interprets the requirements, and creates a solution based on the data. The solution concept is manufactured, which involves production personnel interpreting designer's conceptual sketches or ideas. Subsequently, somebody is installing the solution at the workplace, without knowing anything of the origin to the problem.

This story illustrates some of the stages of interpreting meaning that can take place. Such translation of meaning from some individuals to others, in a chain of interpretations, can result in a solution that is different from what the employees asked for, and possibly also from what is actually needed, as illustrated in Figure 8. I agree with Robinson and Bannon's (1991) account of the risk of such 'ontological drifts' during a design process being that it can contribute to outcomes that are more or less unworkable. The central point is the use of representations, for example through a participatory design process that supports the translation of meaning between parties, and therefore limits the risk of misinterpretations.

In this, I neither consider the employees' description of what they need as inadequate, nor do I regard safety regulations as useless. Instead, and as a summary of this section, I emphasise that there are various perspectives, 'realities', and solutions that need to be explored in terms of consequences. Preferably, this ought to be done in collaborative activities where misunderstandings like the ones illustrated in the rather simplified Figure 8 can be reduced to a minimum.

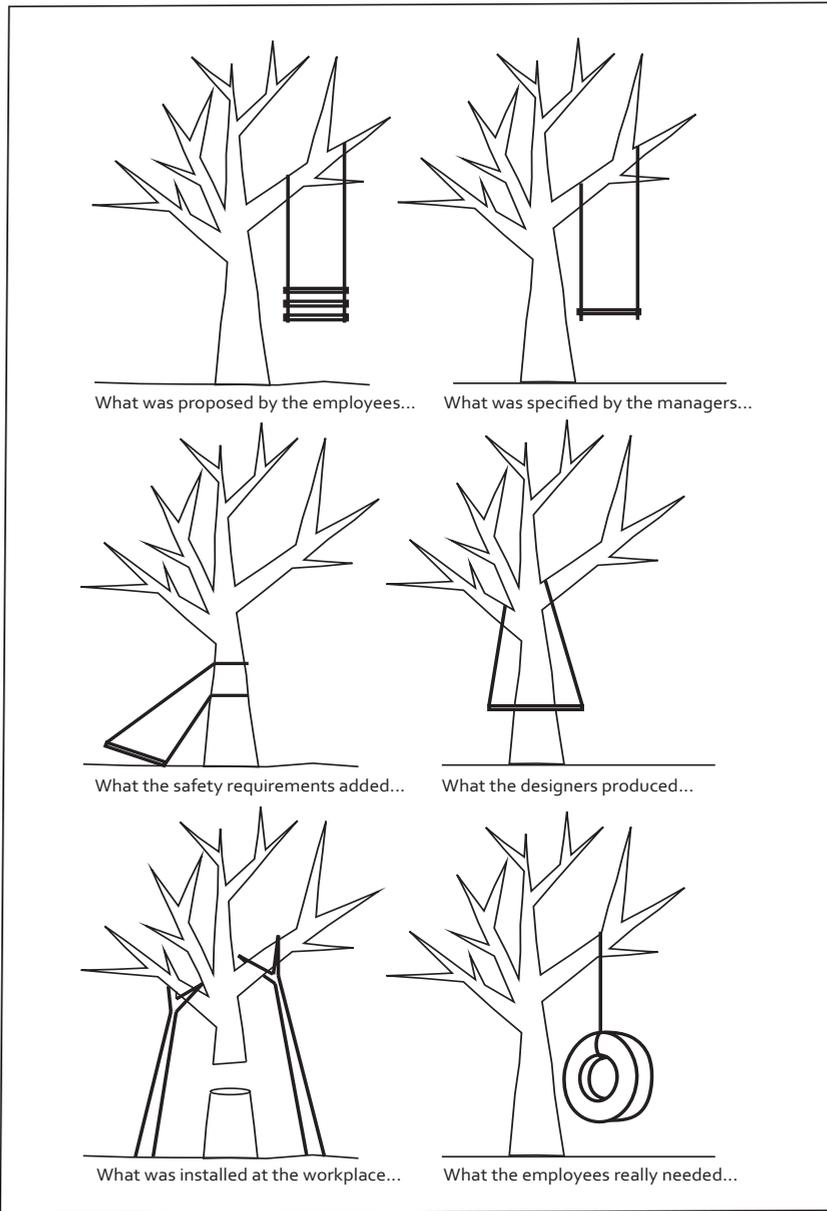


Figure 8. Visualization of ontological drifts.

## LANGUAGE GAMES

In philosophy, language is seen as a social phenomenon of its own (e.g. Foucault, 1977; 2002a). A language system can be seen as an established set of rules or as a 'corpus of statements', that is, values that must be defined in order to understand what can be seen as a bounded space of embedded 'rules' that approves some performances and hinders others (Foucault, 2002b). Language and meaning can therefore be seen as interrelated entities with no clear distinction between. The relevance of this is in understanding both explicit and implicit meaning in human expressions.

For a design practice, this is also relevant as it implies more than asking people in surveys or interviews, since people are not always aware of the intrinsic meaning of things and situations. To exemplify this, Krippendorff (1995) discusses that in speaking to each other, people talk and listen to each other's voices, and identify and coordinate use of words, how they are spoken, and body language in relation to each other, and thereafter decide what matters for the individual and collaboratively constructed meaning. This is generally an unconscious act, in the sense of the activity often being undertaken without active deliberations. Krippendorff discusses such discourses as phenomena of various constructed meanings, expressed in written texts, in language, in symbols, and in individual and collaborative understandings.

Wittgenstein once coined the concept of *language-games* in *Philosophical Investigations* (1953/1992). This can be described as propositions about meanings, logics and use of words. Wittgenstein defines this as follows;

"The word 'language game' is here intended to emphasise that talking of language is part of an activity or a way of life" (Wittgenstein, 1992 p. 21 Author's translation)

In this expression, I sense his notion of language as a 'game', in the sense of a constructed set of strategies and/or rules applied to certain situations and within particular practices. Language games therefore in this view constitute how people interact and construct meaning.

Wittgenstein describes humans' life worlds as social practices in which the learning of a language involves to inherit, construct and perform social meaning. The social practice of language games is not restricted to the natural language, rather, as I understand it, it involves the various practices and life worlds that humans are part of.

Ehn (1988) describes this as follows:

“Language games are performed both as speech acts and as other activities, as practice with ‘embodied’ meaning within societal and cultural institutional frameworks. To be able to participate in the practice of a specific language game one has to share the form of life within which that practice is possible. The form of life includes our natural history, as well as the social institutions and traditions we are born into” (Ehn, 1988 p. 106)

Similar arguments can also be found in Dewey’s ideologies. For example, the notion of ‘*experienced realities*’ involves criticism of accepting reality as a statement of fact. This challenging of mind-sets can be undertaken through reflecting, questioning and challenging perceptions of situations and practices (Dewey, 1998a). This implies subjecting perspectives to test in the light of what is perceived as experience by reflecting on both the individual and the collective level. Thus, what is perceived as experience or reality may change and transform after inquiry into that very experience. The reflection can be supported by presenting factors, such as historical or cultural beliefs that in retrospect are perceived otherwise, for example, factors that question the conditions of the experience.

As contemporary design practice often involves interaction with a variety of people, whether in product development teams or in PD practice, the need for understanding language games as part of a practice discourse becomes even more important. Binder and Hellström (2005) discuss the changing design agendas, as the practice of contemporary design more often means being a member in a design team, engaging in dialogues with clients, users, manufacturers, and consumers. Therefore, there is a need to understand the language game applied within each group to be able to communicate and understand experience and meaning, and thereby create valuable outcomes.

## **DESIGN-DRIVEN INNOVATIONS**

Design and innovation are two related, but not interchangeable, concepts. The general understanding of design is in the sense of somehow concerning with creativity and form. Innovation is generally understood as the creation of profits, growth and new businesses (Schumpeter, 1983).

In contrast, Verganti (2009) proposes to understand innovation as management of meaning. As he perceives, the success of a product lies in the landscape being built around the concept of

innovation, rather than complementary assets such as distribution, market penetration, and low labour costs.

Verganti further elaborates this as firms that develop radical innovations are stepping back from users and are taking a broader perspective. They explore how the context in which life is evolving, both in sociocultural terms (how the reasons people buy things is changing) and in technical terms (how technologies, products, and services are shaping that context). Most of all, these innovative firms "...envision how this context of life could change for the better" (Verganti, 2009 p. 11). This is a rather contrasting perspective of innovation or of being innovative that Verganti proposes as design-driven innovation. Although, I consider the idea of stepping back from users inadequate, if one does not have an understanding of human's various experiences and values. As previously mentioned, I concur with the idea of meaning as a fundamental design principle. I consider the importance to be to implement a strategy of qualitative explorations of meaning in socio-cultural and technical factors as possible opportunities that can contribute to innovations.

Buchanan also recognizes the understanding of human meaning as vital for design of various situations. As he puts it:

"In fact, signs, things, actions, and thoughts are not only interconnected, they also interpenetrate and merge in contemporary design thinking with surprising consequences for innovation" (Buchanan, 1992 p. 10)

As mentioned before, I consider innovation to be dependent on a reframing of position, on raising new questions and thinking of alternative solutions. The realization of the interconnected aspects of practice, meaning and innovation indicates a possible future route, both for design practice in general, and for innovative work and workplace design in particular.

Like Brown (2008), I therefore propose to consider innovation by the contribution it may make to improve people's lives. In Brown's description, the contribution of design to innovation is described as a basic empathy for human experience and the ability to explore and integrate complex and contradictory problem descriptions into novel solutions that are dramatically different from existing ones.

The relevance of design-driven innovation to the current study can be seen as similar to Kanter's (1988) metaphor of innovation as "let a thousand flowers bloom", a slogan used to provoke a variety of new ideas. Like flowers, she considers that innovations have to

be nurtured carefully until they blossom. An important aspect in this metaphor is that a diversity of flowers should bloom. I understand this aspect to deal with having a variety of perspectives involved in innovation processes, which in turn are exploring a diversity of alternative solutions.

## **THINKING INNOVATIVELY**

Thinking innovatively can be associated with creativity, and in turn, creativity can be associated with design, art and innovations. However, whereas creativity is a central concept in design, and designers in general are considered to be good at thinking innovatively, design includes more than creativity as it usually involves outcomes as well. Creative thinking, as Nelson and Stolterman (2003) contend, does not necessarily involve an end result. Creativity is however a central condition for thinking innovatively and therefore relevant in the current research approach of change by design, and hence further elaborated in this section.

Similar to notions of design, creativity is a rather vague concept that embraces a lot of definitions. For example, creativity is often mistaken for productive thinking or problem solving. This can be exemplified in that many people consider thinking of as many uses of a brick as possible, or basically the application of a creative method, as being creative, as Jones (1981) says. Like him, I do not consider this to be creative thinking, as this is analogous to his previously mentioned criticism of a rational application of a specific set of design methods not necessarily creating good designs. Instead, as Jones states:

*“A more profound notion of creativity is that of being able to change one’s view of things, and of oneself, to the point of attempting something you thought was impossible, beyond you. Creativity in design processes shows itself in the originality of one’s question, aims, classification, processes, etc.” (Jones, 1981 p. xix)*

Jones further states that he usually avoids the concept of creativity, as it usually implies problem solving, productive thinking, control, and idea management. Instead, he prefers the expressions ‘innovativeness’ or ‘imagination’, illustrating the close relationship and broad definitions of the terminology.

Even if only a few people have a natural aptitude for creativity, de Bono (1968) asserts that it is a skill that everybody can develop. In line with his ideas, I consider creativity more of an attitude, a

change of thought patterns, and an escape from dominant ideas. As he states;

“In many closed communities, be they scientific or industrial, ideas tend to get very inbred. An outsider who can offer a fresh point of view may stimulate new ideas” (de Bono, 1968 p. 31)

For example, people tend to think that they know how things ‘really are’ and that they see the world the way it ‘actually is’. This perspective is most comfortable to apply and easy to maintain in dealings with familiar people and everyday routine situations. Serious involvement in thinking innovatively is in de Bono’s (1978) view however a question of deliberately exploring experience for a specific purpose. This is therefore relevant to the current research, as it concerns making people thinking innovatively.

As rationality is the dominant understanding, most people believe that logical thinking can prove any point of view. In contrast, de Bono argues that with different starting views, logical thinking can lead to contradictory conclusions.

Like de Bono (1968; 1995), I consider the most vital aspect of creativity to be the ability to accept that individuals can have different experiences of the same thing. Therefore, it is necessary to explore various understandings, and not accept an arrogant assumption that there are only a few alternatives. This includes a willingness to listen, that is, to seriously consider and reflect on other people’s views. Creative thinking therefore involves an open-minded attitude, in contrast to logical thinking, which tends to neglect human feelings. As stated:

“New Think has to do with breaking out of the old, self perpetuating patterns and generating new ways of looking at things.” (de Bono, 1968 p.1)

de Bono further discusses awareness, such as making people aware of alternative ways of thinking. The logical thinking approach follows the most obvious line of thoughts, straight up or straight down. Creative thinking on the other hand seeks to get away from patterns that lead in only one direction and move sideways by reforming the patterns. A reflection of this is that much effort is devoted to how to make various technological systems more effective, instead of focusing on how to make the system of the mind more creative, and hence possibly also more efficient.

Consequently, if a rational logical thinking approach alone is applied, alternative solutions cannot be found, since such procedures tend to disregard alternative experiences and

understandings. Only when confronted with some kind of unfamiliar situation or a crisis are people forced to re-construct ways of thinking in new patterns (van de Ven, 1986).

Like the designer ambition to analyse, integrate, and express various aspects in a design to make it understandable, I consider that creative thinking can be described as building a 'mental model' that can be used to understand certain phenomena. When such a mental model is created, a reframed mind-set has occurred that leaves that person with new knowledge of the situation explored. Additionally, I think that it is easier to be reframing mind-set the more one practice it. As a consequence, a useful activity for developing creative thinking can be to try reconstructing understanding of some phenomena every day.

Amabile (1983) says that creativity is made possible by three main elements: 1) knowledge and understanding of the context and situation, 2) awareness of alternative ways of problem solving, and 3) motivation and commitment to the task. She contends that different individuals understand, navigate, manipulate, try, and challenge problems in different ways. According to her, being creative hence depends on an individual ability and opportunity to maintain complexity and ambiguity, to wait for the 'right' solution, to take risks, and to be independent.

However, at the same time, aforementioned arguments state that people in closed communities, for example in certain work and workplaces, tend to stop challenging the way things are and instead employ an acceptance of 'what is' (de Bono, 1968; van de Ven, 1986). Amabile's second aspect of awareness of alternatives therefore necessitates an open-minded organisation that actively encourages thinking innovatively. Furthermore, her account of motivation and commitment to the task necessitates the individual's capability of taking action. All people do not have power or ability to take action, even if they want to. Hence, there should be stress on innovation being an interactive collaborative activity rather than seeing it as an individual duty. In my view, Amabile also neglects a vital aspect of creativity as thinking in a radically new way through challenging prevailing logic.

In contrast to Amabile, Rehn (2010) discusses creativity as 'dangerous thinking'. Herein, the notion is that radically new ideas only prevail when people are forced to move away from 'comfort zones', that is, when they are seriously questioning and challenging the status quo. Thus, Rehn criticizes the prevailing approach to creativity being to imitate other approaches by applying some creative method. He further argues that expanding mind-sets is not

enough, seriously questioning and challenging the basic logics is needed for seriously creative thinking. He states:

“You do not get more creative by exposing your brain to talks and games, but by forcing the brain to do things that are different, awkward and heavy”  
(Rehn, 2010 p.30 author’s translation)

In this I agree with the notion of serious creativity, radical innovations and good design being about doing things differently, about challenging and reframing mind-sets and continuously questioning the ways things are. I agree with the argument that creativity should be a little ‘dangerous’, bordering on what is considered as comfortable or appropriate, to really challenge dominant ways of thinking.

Kelley (2001) argues that innovation increases in organisations with workplace cultures that encourage creativity. Elements that Kelley proposes, and which I recognize as vital for creativity, are to continuously reframe mind-sets through observations and reflections of other ways of doing things, and the ability and opportunity to ‘prototype’ various solutions. In this context, to ‘prototype’ means the activity of exploring a particular problem through creating various alternative solutions. This is similar to Dewey’s notion of ‘*learning by doing*’ (2008), as it involves a situation in which one learns of the problem through the exploration of different solutions.

In the current study, the various understandings of creativity involved the ambition to challenge prevailing logic and illustrate various experiences and understandings. As many contemporary organisations agree with innovation as an important task, my ambition was to illustrate the idea of innovation as dependent on thinking differently about thinking innovatively.

## 3.3 CHANGE, DESIGN AND GENDER

In this section I describe some gender theories and their relevance to change and design. In the Future Factory project, one of the fundamentals was the previously mentioned issue of the limited number of women participating in the design of work and workplaces in the industrial sector. As mentioned before, men's perspectives are not necessarily gender-neutral or all-encompassing and a project aim was therefore to probe change and future visions based on various stakeholders, including women.

### THE CONCEPT OF GENDER

The term gender was introduced in the mid-1970s to differentiate the biological sex from socially and culturally created meanings and perceptions of women and men. The term gender is often used within academia, whilst the term equality and diversity are more frequently used terms in policies and gender activities in practice. Generally speaking a gender perspective comprises analyses of differences in opportunities and influence for women and men in politics, work, education, science, culture, and other arenas. Gender studies are hence often motivated by strive to create democratic (human-centred) societies.

As previously noted, the European Commission (2005) states that gender equality has not yet been realized, the labour market still favours men over women and reflects and reinforces traditional stereotypical gender roles. This is done despite the fact that the majority of both women and men no longer agree upon the previous tight compartments of what being a woman or a man involves. One reason for gender still being an issue can be that gender is embedded in the systems in which we humans operate, in the way we identify ourselves, in our interactions, in power relations and in the society as a whole (Berner, 2004). Therefore, gender can be seen as a stable state that is difficult to change despite rhetoric on the need to create equal societies.

A common understanding of equality deals with a numerically equal representation of women and men. The Swedish Government Offices (2008/09:198) define a gender equal representation to constitute at least 40 per cent of women or men in all departments, professional areas and among management. It is further stated that

only when women and men share power and influence, has an equal society been accomplished. In the Swedish Government's proposition it is asserted that equality contributes to economic growth through the liberation of people's competence and creativity (Swedish Government Offices, 2008).

In recent years, the term diversity has gained acceptance, sometimes at the loss of the gender concept. It seems that for many people, diversity is easier to talk about. Perhaps this is because many people relate gender issues to "the problematic women's issue", notwithstanding that both men and women are included in the term gender. The notions of equality and diversity have many similarities, but also differences. One problem with the term diversity is that it comprises many aspects at one general level. For example, in practice, the right to various sexual orientations could equal with the right to various hair colour.

## **DOING GENDER**

Whereas equality is a concept that most people have some understanding of, the notion of '*doing gender*' is often not an equally familiar concept. This involves the perspective of gender as not something we are, but something we do (West & Zimmerman, 1987). For example, in order to understand why there are few women in the industrial sector, and above all to understand how to take action for change, it is relevant to outline some basic theories of the *doing of gender* in society. In this, I hence strive to explore Kanter's argument for innovative workplaces as concerned with:

"To grow in organisations that has integrative structures and cultures emphasizing diversity, multiple structural linkages both inside and outside the organisation, intersecting territories, collective pride and faith in people's talents, collaboration and teamwork" (Kanter, 1988 p. 172)

Drawing on this, development of an innovative culture therefore concerns gender and power constructs that affect people's life space.

For example, the Future Factory project was initially formulated based on the idea of organisations that in general are considered as gender-neutral, but which in practice often are gender-blind. The meaning of this is that unawareness of '*doing gender*' in organisations contributes to stabilizing unequal gender systems (Wahl et al., 2001).

The predominant gender-blindness implicates discussions of gender issues, as it contributes to a general notion that every

individual has equal capability to take action. Several gender researchers have illustrated that this is not the case. For example, as Acker (2006b) states:

“I define inequality in organisations as systematic disparities between participants in power and control over goals, resources and outcomes; workplace decisions such as how to organize work; opportunities for promotion and interesting work; security in employment and benefits; pay and other monetary rewards; respect; and pleasures in work and work relations.” (Acker, 2006b p. 443)

Thus, a conclusion of gender inequality is that gender systems influence both people and society. For example, contribution to and participation in knowledge-building, research and advances in both science and society have traditionally been the privilege of professions such as scientists, researchers, designers, architects, engineers, innovators and entrepreneurs. Since women were not involved in these contexts at all or were in minority until the mid 20<sup>th</sup> century, and are still often very much in the minority, it is apparent that women have less opportunity to influence (Berner, 2004).

The concept of ‘*doing gender*’ involves what West and Zimmerman (1987) refer to as prevailing logic in society contributing to constructing expressions of masculine and feminine ‘natures’. In this view, both women and men do gender, but it is a situated-based doing, with an embedded awareness of the construction. Therefore, as they conclude, rather than being an individual property, ‘*doing gender*’ involves a social construct that is used both as an outcome of and a rationale for various arrangements, which are used to justify one of the most fundamental divisions of society (1987 p.126).

‘*Doing gender*’ is hence concerned with behavioural aspects, in contrast to the biological differences of what it means to be a man or a woman. This means that gender is seen as a situated identity, applied, or consigned to, different situations. As West and Zimmerman states, many situations are not clearly categorized from the start, but are sooner or later pressed into the interests of ‘*doing gender*’. This involves the understanding of gender as not solely internalized in childhood, but created throughout life. As it is a dynamic construct, it can also be radically changed in much shorter time than in socialization approaches that include generational shifts (Deutsch, 2007).

Moreover, an unequal gender system can be seen as a force that counteracts change and thinking innovatively, both in society

and within organisations (Abrahamsson, 2000). Given the propensity for change and innovation that exists in society today, it may thus be an incentive to challenge the gender system once and for all.

## **GENDER SYSTEMS**

In the approach of deconstructing prevailing logic, the concept of a gender system can be useful. Hirdman (1988) describes a gender system as a network of processes, phenomena, beliefs and expectations that give rise to a constructed and systematic pattern of relations between women and men. The result of a gender system can be seen as the actions or the social practice that is created within families, at workplaces, in religion, in literature, in science, and in society as a whole.

Unequal gender systems consist of two forms of prevailing logic: *segregation* and *hierarchy* (Hirdman, 1988). The segregated labour market can for example be observed in women and men being in different areas and having different occupations. In Sweden, nurse and secretary are considered as traditional women's occupations, and engineer and fire fighter are seen as traditional men's occupations. This gender segregation of vocations can create unequal conditions, there are for example arguments for people thereby having unequal conditions in terms of, for example, salary, working hours, working environment, and development opportunities (Lindgren, 1985; Sundin, 1993; Hirdman, 2001).

In *Men and Women of the Corporation*, Kanter (1993) does not specifically speak of the concept of Doing Gender or gender systems, but states that work makes the human. Her striving in this is to illustrate how work organisations can develop a workplace culture that makes them more productive and innovative, both in production and work methods. In this, Kanter's commitments sounds like an echo of the Future Factory project, or perhaps more accurately, the other way around. Her theories are concerned with the influence of structures and systems of organisations, in shaping individual behaviours that either contribute to or counteract productivity.

The numerical structures are by Kanter (1977; 1993) divided into four basic different categories. The *uniform* structure consists of only one social type, with a typical ratio of 100 to 0. An example can be a homogenous workgroup consisting of only white men. The *skewed* structure has a ratio of 85 to 15. This means that there is a dominant social type, however, there can be a few different persons,

for example, one black man or one woman. In the *tilted* group the ratio is slightly off, as Kanter states approximately 65 to 35, which means that there is still a dominant social type that controls group behaviour. A *balanced* group is in this view somewhere near the ratio of 50 to 50, but can vary up to 60 to 40. An observant reader may notice that a common numerical equality is placed in the ratio of a balanced group.

The structure is interesting as it results in different behaviour that can either contribute to productivity and innovation or counteract the same. Kanter (1993) refers to this as structural and contextual effects that include opportunity and power effects.

### MINORITY ASPECTS

The concept of *token*<sup>14</sup> is perhaps what Kanter is best known for in this respect. This involves how being in minority in a group can affect both behaviour and performance. She explains this as the dynamics of interaction as a token reflects both general aspects of being in minority, as well as reflecting specific cultures and traditional roles of both the token and the dominant group. For example, because tokens are in minority, they are often seen as representative of their ascribed category to the group, as Kanter states, "...they will always be a hyphenated member, as in 'women engineer' or 'male nurse' or 'black physician'" (1977 p.968).

This results in three experienced phenomena, visibility, polarization and assimilation. *Visibility* concerns the fact that although tokens are in minority, they attract a larger share of attention. The *polarization* phenomena involve an overemphasis on differences between the dominant group and the token, and the third perceptual tendency of *assimilation* involves the use of stereotypical association to illustrate the differences. According to Kanter, the visibility perception creates performance pressure, polarization leads to group demarcation and isolation of the token, and assimilation traps the token in certain roles.

All these constructed and experienced phenomena result in symbolic consequences. Kanter exemplifies with women in the minority not acting for themselves alone, but having to represent the whole category of women. There is also a performance pressure that results in some women feeling they have to work twice as hard to prove their competence because their actual work is otherwise unnoticed. Kanter emphasises that the structural and contextual

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<sup>14</sup> Token: here defined as an individual in minority within e.g. a work system, compared with a dominating group (c.f. Kanter, 1993)

phenomena must be understood and included in any organisational change that aims to build an innovative workplace culture.

The distinction between men and women in different vocations and areas also leads to a *hierarchical* classification of gender. This can for example be observed in the fact that professions and areas that traditionally engage more women are often seen as subordinate in relation to professions and areas that traditionally engages men. This relates to what de Beauvoir (2002) describes as men being the norm, the first, and women the second. An illustrative example of this is that there is generally talk of football or women's football, referring to men's football as the norm and women's football as the subordinate abnormality that needs to be hyphenated with a gender attribute.

### **IMPLICATIONS OF GENDER SYSTEMS**

The relevance of gender systems can for the current research be exemplified as women within the industry sector often do specific tasks in certain areas, which often includes more repetitive tasks, more sedentary and more "tied to a machine or a particular area" type of tasks, compared with men's tasks and areas (Lindgren, 1985; Baude, 1992; Abrahamsson, 2009). One consequence of this is for example more long-term sick leave among women in the industry sector (AFA, 2007), compared to men. Even in cases when women do the same type of work as men, there can be more cases of musculoskeletal symptoms among women.

This has been used as an argument for not employing women, expressed, for example, as the work is too heavy for women's bodies (Abrahamsson, 2009). However, the reason is generally not women being weaker, but workplaces, tools and equipment being designed based on men's conditions and bodies. Thus, a gender-aware practice could remedy some of the experienced problems.

Maintaining the gender system involves continuous re-establishment of what are considered to be 'facts', 'truth' and 'reality'. This means that there is an opportunity to renegotiate and reconstruct gender systems. For this reason, Drejhammar (1998) suggests initially working with homogenous groups, in order to develop a social identity. According to her, working with women exclusively contributes to a share of experiences, and therefore possibly the recognition of that implications for women rather is based on unequal structures, norms and practices, than on individual shortcomings. Through reflections, the ambition is to gain insights and understanding of present states and hence tools for taking action.

In 2007, 18 per cent of those employed in the Swedish industry sector were women (Statistics Sweden, 2007). Although relatively stable over the years, that number has more recently decreased to 16.5 per cent women (Statistics Sweden, 2010b). The relative scarcity of women in the industrial sector seems to point to some macro-level factors that go beyond to simply “add women and stir”. For example, it is often said that in the industrial sector wages are higher, and the job is easier compared with the health sector. Still, despite decades of equality planning there are few women in the Swedish industry sector. Some of these macro-level factors I consider relevant to both design and innovation, besides being relevant to equality in general.

## **POWER IN RELATION TO DESIGN AND GENDER**

As mentioned before, change and thinking innovatively call for people to be challenged to reflect on their taken-for-granted assumptions, norms, values, experiences, and so forth. However, the assumption is that people have the possibility to act, that is, that they have the means to change their life worlds. This is not always the case, rather, this sometimes involves aspects that have dependencies beyond individual control. Change processes therefore often concern aspects of power as well.

The concept of power is abstract and difficult to grasp, since it is both omnipresent and nowhere simultaneously. Power can be seen as the ability to influence or achieve goals. There is a distinct difference from the concept of equality in authority. Power can relate to *hierarchies*, for example some occupations or job tasks being seen as superordinate or subordinate. In these respects it relates to gender segregation and hence gender inequality. For example, Kanter (1993) argues that most factory workers and lower ranks in an organisation have been rendered powerless both by the exclusion from participation in decision-making, and by the routine tasks that reduce or even eliminate every opportunity to be creative.

In the 1960s, Foucault presented the power concept as a complex phenomenon. He did not see power as a possession held or oppression practised by some people at the expense of others. Rather, Foucault (1990) regards power as a relational and productive tool, and states that without power, nothing is achieved. Power should in his view be understood as multiple forces working in a certain operational space. Therefore, power is the *in situ* force

relation that engenders certain states of power, at a local level and in an unstable manner. Foucault states that power is omnipresent, not because of an overall authority, but because of the structure of power in social relations.

Börjesson and Rehn (2009) describe a system as a set of techniques through which things are made manageable and less complex. In this, there is a difference between analysing power based on what is seen in a certain context, and analysing the phenomenon by the meaning inscribed in power executions. Thus, the system view of power can have a different meaning to an employee, compared to a person external to an organisation. The external person may not even recognize or identify certain situations as constituting power.

Power expressions can be exemplified through some companies reading employees' mail. Some companies use software to register how many times keys are pressed on the keyboard, some even want to have microchips that registers one's whereabouts and actions.

## **POWER IN PHYSICAL SPACE**

Processes of inclusion and exclusion can be referred to as rules and principles of a game board, setting different conditions for different players (Börjesson & Rehn, 2009). In line with this discussion, the metaphor of a game board can be constructed in the physical space by an office with a door, symbolizing importance, whereas a desk in an open landscape symbolizes the opposite. Industrial plants' open area hangar-like buildings can be considered as another step down the scale of power.

A plausible design contribution to the creation of power can be illustrated by means of Bentham's ideas of the *Panopticon*. Foucault (1995) refers to the Panopticon plan, as the ultimate demonstration of a physical space in which power can be ensured through surveillance, even though both invisible and unverifiable. As he states:

"The theme of the Panopticon - at once surveillance and observation, security and knowledge, individualization and totalization, isolation and transparency" (Foucault, 1995 p. 249)

Bentham developed his idea of the Panopticon<sup>15</sup> as a circular building, in which small rooms occupy the perimeter and the supervisor function occupies the centre (Bentham, 1995), see Figure 9. The ideas, or plans of management as Bentham put it could, he claimed, be adapted to any sort of establishment, in which persons of any description are to be kept under inspection. In the idea of the Panopticon, power can be said to be omnipresent in the physical space, through the superior or monitoring functions present in the middle of the building.

I present the idea of the Panopticon here as an example of how buildings and environments should *not* be designed. I consider that the ever-present feeling of being observed, for the above-mentioned reasons, may have negative effects for the nurture of an innovative workplace culture. As previously mentioned, Lewin's (1947) idea was that behaviour is a function of both persons and environments. Hence, a workplace designed for optimal supervision of employees, may counteract an innovative workplace culture and also result in undesirable behaviours. This could be the result of a perception of being continuously controlled, in combination with people's experiences of having to be supervised.

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<sup>15</sup> Panopticon refers to *panoptic*; meaning fully transparent, or an all-seeing eye ([www.ne.se/engelsk-ordbok/panoptic/704127](http://www.ne.se/engelsk-ordbok/panoptic/704127) (2011-07-26) and [www.ne.se.proxy.lib.ltu.se/lang/jeremy-bentham](http://www.ne.se.proxy.lib.ltu.se/lang/jeremy-bentham) (2011-07-25))

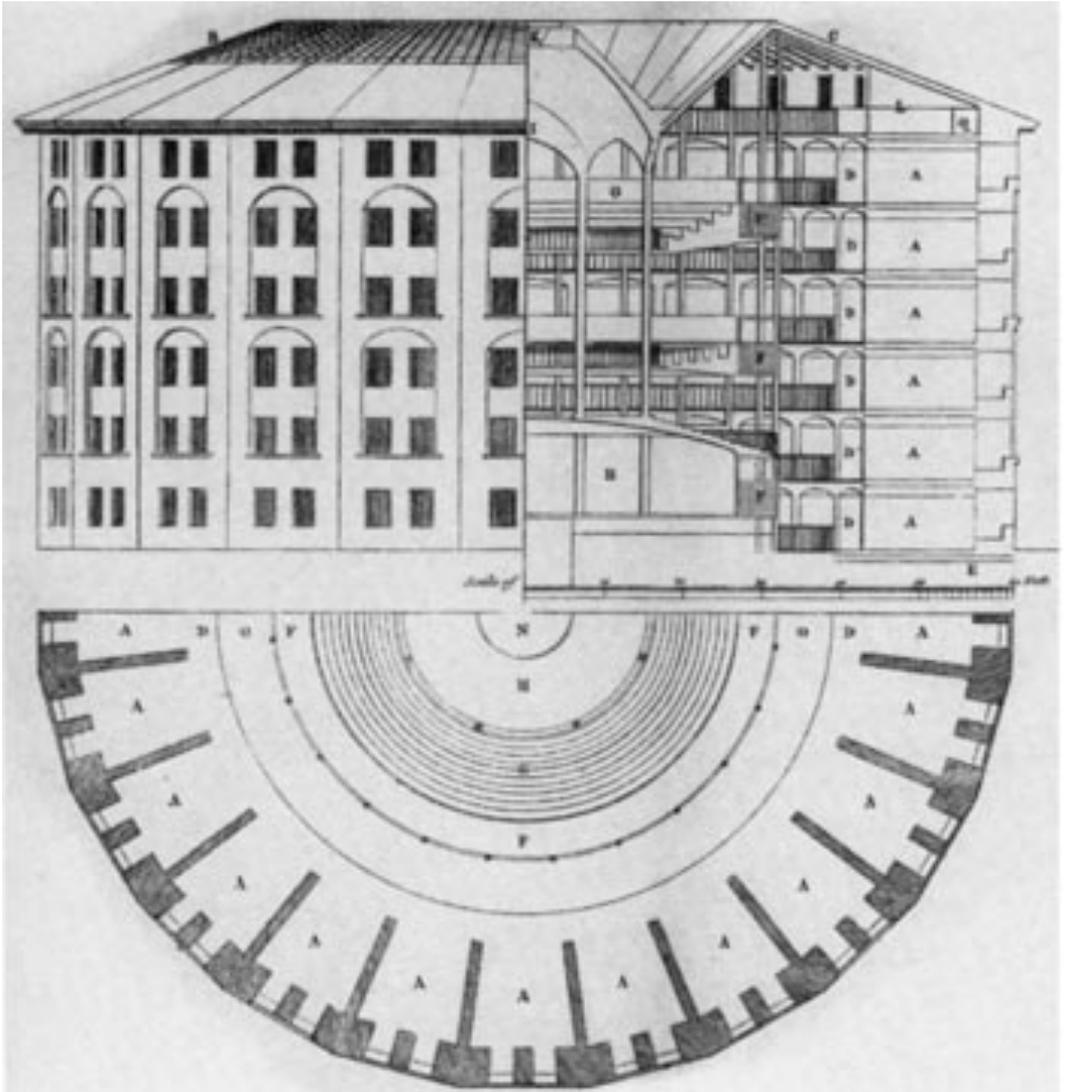


Figure 9. Illustrates Bentham's plan of the Panopticon, originally from 1791. Image: Jeremy Bentham

## **GENDER AND DESIGN**

One argument for inclusion of gender theories in the practice of design can be the prospective of design outcomes contributing to 'Doing Gender'.

I have previously mentioned the suggestion that gender-blindness results in maintenance of an unequal gender system. For example, Fagerström (2010) describes that also designers tend to be gender-blind, and therefore by non-reflection use the male body as norm. One example is Fagerström's description of her own office chair, which caused serious back-pain. When consulting an ergonomist, the answer was that the chair was too big for her. It was designed based on a male body and therefore caused her pain. This was an ordinary office chair, available in most offices and not usually considered or promoted as a specific women's or man's chair. The relevance of this is not that chairs should be sold as woman or man's chair, but that they should fit the body that is supposed to use them. Specific design for women is an increasing field, as product developers seem to have realized a new market. Many of such products, however tend to contribute to the 'doing of gender', as women's products are often expressed with almost naïve aesthetics, that is, simplistic forms, and soft pastel colours.

## **GENDER TROUBLE**

One way to challenge the gender system is to create what Butler (2006) refers to as 'gender trouble'. This is explained as a way of challenging habitual presumptions about gender. In this, Butler argues for gender trouble being about challenging the habitual presumption of the white heterosexual norm in society.

Butler discusses performativity of gender; drawing on Derrida's theories of deconstruction in the sense that what is anticipated invokes the object. As I understand this, if there are anticipations of women and men performing in certain ways in a community or in society, then that will be the result. Thereby, the 'doing of gender' can be seen as an expectation that ends up producing the very phenomenon it anticipates. Put differently, if a woman is expected to behave in certain ways in a specific context, this might be the result, as most people intentionally or unintentionally adapt to the norm.

Likewise, drawing on Butler, Mörck and Peterson (2007) discuss that reducing discussions of gender to dichotomies such as good or bad, progressive or conventional, female or male, and so forth, contributes to gender trouble. In their study, the objective

was of using reversed gender representations. This can be one way of questioning things taken for granted, norms and practices. By reversing gender stereotypes, there can be attentiveness to gender as a constructed phenomenon. Hence, this can be a way of causing gender trouble, to destabilize the prevailing logic of what is considered as female or male and how women and men are expected to act.

In the seminal exhibition *Formgivning/Normgivning*<sup>16</sup>, Jahnke among others, visualized the 'doing of gender' in design. One of the many illustrating example in this exhibition was the illustration of razors for women and men having different forms, that is, hard forms and strong colours for men's razors, and soft forms and soft colours for women's razors (Jahnke, 2006).

Equally, the marketing of the products contributes to a reiteration of gender systems, as was demonstrated in the exhibition. This was exemplified in that women's products in general are marketed with smiling women, illustrating notions of tenderness and softness. In contrast, men's products are often promoted by famous sports people, who are visualizing notions of toughness and hardness. In addition, even the product's names contribute to the construction of gender identities, as the razor for men is called 'Mach 3', illustrating power and force, and the one for women is called 'Venus', the very symbol of beauty, love and fertility.

When this exhibition material was shown to students, I received different reactions. Some stated that designers simply make what people want, it is not in their power to change market needs. Others were rather upset that nobody had pointed out the construction of gender stereotypes in design earlier. I think of this as a simplified study of some attitudes in contemporary society: Either people seem to consider gender as a stable state that cannot be changed, or people seem to consider gender stereotypes as constructed over and over again in structures, systems, interactions, symbols and designs.

## **NORMATIVE DESIGN**

Thus, for the above-mentioned reasons, design can be seen as having a normative character. For example, *function* generally refers to the principal purpose of a product. Therefore, the function ought to be the same regardless of various product models. However, this is not always the case, products that have an intended market for

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<sup>16</sup> Author's translation to English: Form giving/ Norm giving

men are often expressed as having more functions, regardless of whether it concerns screwdrivers or irons. As Ehrnberger (2007) states, the aesthetic principles of separation and hierarchy hence associates function with a higher value and male characteristics, whilst decorations often associates with female characteristics and a subordinate value.

A thought-provoking example of this argument is the illustration of two tools, an electric screwdriver, a product that in general is associated with men, and a kitchen blender, which in general is associated with women (Ehrnberger, 2007). The interesting property of the screwdriver is in this analysis that it is more decorated than the kitchen blender. Although, the screwdriver is by tradition considered as a product for men, who in general are considered to emphasise function over form. In this product, there seems to be a need to increase the expression of power and performance through a variety of decorative stripes and alternative function buttons. The kitchen blender on the other hand, is less ornamented and almost has a naïve expression. The function is made possible through the press of one button, on or off.

After analysing the products separately, Ehrnberger reversed the gender of the design expressions. The consequence was an electric screwdriver that have the expression of a tool for children, hence as one can imagine, a simplistic design that is not ordinarily seen in power tools. The kitchen blender, on the other hand, looks powerful enough to mix concrete at a building site.

This, I consider to illustrate how design contributes to reiterating gender inequalities, and, therefore, an aspect that I think should be considered in design.

# 4 DESIGN LABS

In this part of the thesis, I describe and detail the methods used and the activities undertaken in the Future Factory project. First, I outline the research team, my involvement and role in the project, and what a reflective design approach meant in the current research study. Thereafter, I describe the exploration of experiences and meaning through interviews and observations in an initial inspiration and preparation phase. The approach to the methods of *Personas* and *Scenarios* is subsequently outlined, as well as *the Future Workshop* methodology undertaken in the current research approach of design labs.



# 4.1 THE IDEA OF A FUTURE FACTORY

In this section I present the context and idea of the current study. This is done to provide a better understanding of the separate methods and activities that are described in the following sections.

## RESEARCH TEAM

The Future Factory project was founded within the multidisciplinary research environment *LTU DesignLab* at Luleå University of Technology (LTU), initially formulated and managed by *Ylva Fältholm* and *Lena Abrahamsson*. The project team additionally and sporadically included other researchers from the research group of Industrial Work Environment at the Division of Human Work Science, and myself, working at the Division of Innovation and Design. These group members comprise experiences within areas such as industrial production systems, ergonomics, change processes, gender, work organisation, and, in this project additionally design methods.

Like the previously mentioned Volvo Car Corporation's YCC project, the idea was to work with a homogeneous group of women developing a conceptual future factory based on women's needs and preferences. The inclusion of other project members widened the project focus into exploration of work and workplaces in industrial contexts with various interest groups. The project base and background are presented in more detail in Abrahamsson et al. (2008) and Abrahamsson & Johansson (2008), and Johansson (2008; 2009).

When I became involved in the project, the main focus still was on having a group exclusively comprising women, with an additional emphasis on young people's needs and preferences, based on the aforementioned report on young people opting out of industrial work. In collaboration, the research team discussed and decided to invite other stakeholder groups, such as industrial management, industrial employees and trade unions, in workshops in order to better understand various stakeholders' experiences and opinions.

The gender perspective that was included in the project meant that I had to rethink some of the traditional design methods. For example, whereas the later described Persona method is said to

contribute to a focus on human experiences, Cooper (1999) at the same time stresses the development of Personas as stereotypes for them to be understandable. If I were to follow the method as described by him, I would hence contribute to 'doing gender'. The gender aspect in the research work therefore involved re-thinking and re-designing of the methods. I did not know beforehand what would contribute to an increased awareness of gender. Therefore, I probed various methods and approaches of thinking innovatively and therefore also applied what could be referred to as a '*bricoleur*' approach (Lèvi-Strauss, 1966) through the '*learning by doing*' (Dewey, 2008).

The team of researchers for this reason provided me with a 'tool box' consisting of various research methods, approaches and ideologies. As I had to rethink traditional design approaches, techniques and tools, I also was stimulated to thinking innovatively. The foremost contribution of this reconsideration is my widened knowledge and understanding of various approaches.

During the project period, the research team members reduced their involvement due to other responsibilities, and hence my role in managing the project increased. For this reason, I emphasise that the research undertaken in the Future Factory project as described in this thesis is based on my considerations and does not necessarily represent the other project team members' understandings.

## **MY INVOLVEMENT AND ROLE**

My involvement in the Future Factory project was not in the initial stage of formulating the project objectives, but lasted throughout the three-years project time (2008-2010), and also some time after the project had formally ended. Initially, the intention was that my role would be as intervention designer, meaning responsible for the workshop with stakeholders as well as having main responsibility for developing methods and tools for the collaborative activities. Firstly, I therefore focused on understanding the industrial context from literature reviews, and gathered material in interviews and observations.

# THE RESEARCH WORK IN THE FUTURE FACTORY PROJECT



1. Inspiration and Preparation      2. Collaborative Design Space Explorations      3. Synthesis and refinement

2008

2009

2010

2011

ACTIVITY	ACTORS	ACTIVITY	ACTORS	ACTIVITY	ACTORS
Interviews	5 (9)	Workshop women	14	Workshop 2 companies	10
Observation	-	Workshop ind. employees	7	Workshop women	12
Workshop trade union	8	Observation	-	Follow-up interviews	5 (6)
Workshop young people	23	Workshop women	11		
Workshop ind. management	15	Workshop women	8		
Persona creation		Observation	-		
Scenario development		Workshop ind. employees	8		



Refining of personas

Figure 10. Illustrates the current research study in the Future Factory project.

Thereafter, I organized, staged, facilitated, and conducted the workshops, as well as analysed and evaluated the research material, partly in cooperation with other project members. The assembled research material consists of transcriptions from interviews, my and other project team members' field notes and several hours of video and audio recordings, as well as posters, Personas, scenarios and images from all the workshop activities. My role hence changed between being researcher and design facilitator. The project team members did not have previous experience in working with action-based interventions. Therefore I was able to develop my research interest of collaborative design approaches with few restrictions. After the workshops, I returned to my research role and analysed video recordings with 'critical eyes'. Thereafter, in collaboration with the project team members, I adapted, refined, and developed the methodology, as the project advanced.

In the project, I conducted five interviews in 2008 (of a total of nine), conducted a half-day observation of industrial work at one location, as well as organized, staged, facilitated, and conducted three workshops. In 2009, I visited two industrial organisations for half-day observations, and organized, staged, facilitated, and conducted five workshops. In 2010, I organized, staged, facilitated, and conducted two workshops and performed three follow-up interviews. In early 2011, I conducted an additional two follow-up interviews (of a total of six), as well as writing the final project research report (see Wikberg Nilsson et al., 2011). The research activities that I conducted in the Future Factory project are visualized in Figure 10.

The contribution of the team members varied. Some took part in only a few activities and project team meetings, while others participated in several of the activities. I was part of most of the activities. However a research colleague conducted five interviews and two focus group sessions in which I could not participate.

In total, 121 people participated in the project activities with a gender breakdown of 59 per cent women and 41 per cent men. Those numbers follows Swedish gender equality quantitative recommendations, based on knowledge, experiences, and values of both women and men as equally important and implemented to enrich and direct all areas of society (SCB, 2010b).

## THE REFLECTIVE DESIGN APPROACH

In this section I describe the reflective design approach as implemented in the current study.

Firstly, as previously mentioned, some workplace cultures are said to undergo a gradual adaptation to circumstances, until a state where only crisis can stimulate action (van de Ven, 1986). Lewin (1947) for this reason proposed an initial stage of un-freezing, as initiating something that breaks with established patterns.

In the current study, the first stage was that of preparation and inspiration, to find material for the succeeding collaborative project activities that could contribute to an 'un-freezing' of mind-sets.

Secondly, the current study involved a two-fold commitment in learning of participant's understandings at the same time as I had the ambition of providing them with knowledge on how to implement thinking innovatively in work and workplace design. This can be exemplified by Schön's (1983) discussion of the 'reflective practitioner' as a quality of reflection-in-action, in the sense of alteration between development of solutions and consideration of consequences of outcomes. As Schön states:

*"The designer must oscillate between the unit and the total /.../ oscillate between involvement and detachment"* (Schön, 1983 p. 102)

For me, this involved to facilitate and participate in the research activities, at the same time as I strove to reflect on actor's expressions as various 'language games' (Wittgenstein, 1992) in use. This can be compared to Schön's notion of listening to situations' 'back-talk', as people's actions and expressions tell something about how they relate to certain phenomena. In the upcoming sections I outline the methods applied in the current research study.

## 4.2 EXPLORING EXPERIENCES AND MEANING

As the idea of this project was to focus in particular on women's and young people's experiences and perceptions, the intention was to have a preparation phase that consisted of literature reviews, interviews and observations to provide some material and insights for the succeeding collaborative phases. Interviews were also the method used for following up the participants' reflections on the project. The preparatory phase also included some observations, undertaken as half-day visits to industrial organisations varying from small- to large-scale and from process industries to manufacturing industries.

The reason for this was to provide an understanding of various industrial contexts and different types of industrial work. Besides the preparation phase providing a base of various experienced realities and perceptions, I had the ambition to develop Personas, based on the context mapping in the interviews and observations. This is further described in the following section.

### PRELIMINARY INTERVIEWS

The selection criterion for the interview respondents in the early project phases was women working in the industrial sector. The reason for this was primarily to achieve a better understanding of some contemporary experiences. The idea was that this could provide a bank of experiences that could be used in the development of Personas, for later use in collaborative explorations of reasons for women being in the minority of employees within the Swedish industry sector.

It was at first difficult to locate women shop-floor workers, so the minority situation of women in the industrial sector thus became evident already in the preparatory phase. The search for respondents subsequently resulted in five interviews, which I conducted in the project's preliminary phases, and an additional four performed by a research colleague. The interview respondents worked at four different companies at various locations in Sweden, within process and manufacturing industries of sizes varying between some 500 and 3000 employees. They had different work descriptions, such as machine-, assembly-, and process operators,

and were at the time working both at assembly lines and at stationary machines, in varying sizes of work teams and hence, naturally, with varying work-related experiences

In the interviews, I relied on the previously mentioned 'bricoleur' approach (Lèvi-Strauss, 1966), seeing the interviews as the first building blocks of knowledge, experience, perceptions and understandings for the succeeding metaphorical Future Factory 'building'. As my prior knowledge of the industrial sector was rather modest, I was able to ask what might be considered as naïve questions, in the sense of not fully understanding processes and practices. I found this to be useful in those interviews, as the respondents were required to formulate the basics of their practice. Hence, they had to initiate some kind of reflection.

The approach could be likened to a design approach of preparing by understanding a situation of use. That is, to acquire some of the user experiences and perceptions, in order to be able to formulate a solution that provides a better experience, and hence something that is meaningful for the user. In the current case, the 'use situation' was that of working in an industrial context, and therefore involved a broad context and a diversity of experiences.

The idea of the interviews was also to gain some information of contemporary change and development practices in the industrial sector. As change decisions and planning processes seem to be the responsibility of relatively few people in the industrial sector (Bellgran & Säfsten, 2005), I wanted to learn more about various experiences of such practices.

## **OPEN-ENDED CONVERSATIONS**

Like Kvale (1996), I see the objective of a qualitative interview as an attempt to understand and describe perceptions and realities as experienced by the respondent. In general, an in-depth reflective interview is therefore used for understanding how people formulate and account for 'reality', rather than quantifiable aspects of certain phenomena. This can be noticed in the questions being more concerned with the interview respondents' various experiences of the work and the workplace, rather than how many people considers the job to be a good or a bad one, or the measurable data of the workplace. The interviews I conducted were therefore open-ended, in the sense of having some prepared themes and questions. But rather than rigorously following the guide, I strove to follow up on the respondents' answers. In this, the intention of exploring

experiences and perceptions rather than being able to compare answers can be observed.

Kvale uses the metaphor of a traveller to describe interviews as journeys with stories to be told when returning home. This describes quite well the interviews I conducted, as the stories told in the interviews later were used for developing Personas, fictional characters further described in the following sections. Hence, parts of the realities, as those respondents experienced them, were told to other people besides me as the interviewer. Kvale further states that interviews can be seen as structured conversations in which the researcher both sets the terms and controls the situation. In the current interviews, this involved me introducing the topic, although the respondents were able to steer the conversation in the direction of their concerns or interests.

In addition, and like Thomson (2010), I emphasise that the interviewer should be aware of implicit answers, for example, expressed in body language or hesitation, as equally important as the explicit answers of the questions. I could notice this in those interviews, as the respondents in some of the answers gazed out in the sky, almost as if recreating a written text or someone else's spoken words. This is similar to what Argyris and Schön (1975) refer to as the 'espoused theory' of strategies and reasons for doing things. In the interviews, I consider this to involve the respondents sometimes providing what they believed as the 'correct' reasons, either by expressing the practice and norms at the workplace or certain 'logics' held in society as a whole. This can be noticed in the following quotations from one of the interviews; the respondent has just told me that the work operations have time limits:

- "Is it exactly worked out how long time each stage should take?"

- "Yes, all of those work operations, the whole task, must be done in 3 minutes and 20 seconds.

- "Why?"

- "*(Hesitation)* We've got methods for absolutely everything; how to do this and how to do that. Ideally, I think that there is supposed to be a method for everything, even to empty the trash bin, everything must have a method!"

- "Why?"

- "*(Interview respondent is looking over my shoulder- as if looking for answers)* It has something to do with doing things in a particular order, and of course doing things as fast as possible. We can read instructions about exactly where to grip and how to mount most effectively, and all that. *(Pause)*... It has to do with quality, and the prevention of occupational injuries."

*(Quotations from interview 2008)*

In this situation, the assembly line work included work operations performed at a scheduled rate, taking 3 minutes and 20 seconds. As she starts to discuss work methods instead of answering the question of why this operation has to be conducted exactly at this rate, it seems as if she does not have a clear understanding of why. In the statement of; “...*methods for everything, even to empty the trash bin*”, the response apparently illustrates that she considers the work to be controlled and regulated, although without knowledge of why it is so. Following the question of why, she however finally provides the answer, as; “...*it has to do with quality, and the prevention of occupational injuries*”. This is probably how this work method has been justified, as “do the work task like this because it will give quality to our products and it will prevent work-related injuries”. Such instructions are telling *how* to do the work tasks, but neither *why* the product quality should improve, nor *why* this is important. In my view, therefore, it does not give tools for the employees themselves to contribute to enhancing product quality. Also, such instructions do not tell how occupational injuries can be prevented, and therefore do not provide the employees with knowledge of preventing work-related ill-health on their own initiative.

In teaching design methods, I tell students to ask why, several times, as this questioning requires the respondents to really consider the underlying conditions of a situation. This was a method I also used in those interviews, and it seemed to work well in the exploration of the respondents’ experienced realities.

The interviews were 1 to 3 hours long, which further illustrates the open-ended approach, and were audio-recorded and transcribed in order to enable the use of various experiences and quotations in the subsequent Persona development.

## **FOLLOW-UP INTERVIEWS**

After the final workshops in the project, I conducted five follow-up interviews with some of the final project phase participants and a research colleague performed an additional one.

The objective of the follow-up interviews was to obtain reflections of participants’ experiences of the methods and the project activities, rather than exploring their individual experiences and perceptions of work and workplaces in the industrial sector. In design practice, follow-up interviews, focus groups or observations can be one way for designers to enrich their knowledge and understandings of the solutions intended and subsequent practised use (Ulrich & Eppinger, 2008).

The follow-up interviews were prepared with an interview guide, similar to the preliminary interviews, including questions of the project approach, the methods and tools used, and some of the project results. Whereas the preliminary interviews can be seen as structured conversations in line with Kvale's (1996) previous statement, the follow-up interviews had more the character of a dialogue, since the respondents were able to ask about methods and ideas they had taken particular interest in.

Follow-up interviews can also be considered as a way to stimulate learning, as the instigated reflection ideally involves a learning process comparable with Argyris and Schön's (1975) description. Those interviews were between 1 to 2 hours long, and I used an audio recorder to be able to draw quotations from the material later on.

## **THINKING DIFFERENTLY ABOUT THINKING INNOVATIVELY**

One of the questions in the follow-up interviews concerned the intention to stimulate thinking innovatively. In order to stimulate reflection over the methods used in the project, I therefore asked whether the interviewees had ideas of how to approach change that we did not address in the project. One of the participants exemplified this question with the following:

"For example, we had a theatre group at our workplace. They did a role-play of a situation and then stopped. Then we in the audience discussed how the scenario should continue. They acted according to our instructions and we discussed again whether it was a good solution and so forth. This was a good way to initiate thinking innovatively, at least in our workplace. I see Scenarios, both the ones we used in the Future Factory project and those acted role plays as good ways to initiate reflection, as ways to raise awareness" (Quotation from follow-up interview 2010)

In this quotation, it appears as if the respondent considered the young people's scenarios described in the coming sections as means to raise awareness, and hence methods to stimulate thinking innovatively. In addition, she mentions scenarios as role-plays. Likewise, Brandt (2006) illustrates such scenarios as contributing to design space explorations. In the preliminary phases of the Future Factory project we had discussions of role-plays as ways to instigate reflection. However, it was not realized in this project.

As the final phase of the Future Factory project involved the rather unique method of exclusively working with women, I wanted

some of those participants to reflect on this approach. One of the participants said as follows:

“I think it was great, because we strive at getting more women to the shop floor. I have worked within the industrial sector for a long time and I always work only together with men. I think it is a good idea to have both approaches, to work with both mixed and homogeneous groups. As I said, I have tried with only men for a very long time, so it feels good to have a project with only women as well” (Quotation from follow-up interview 2010)

This I consider to support the project idea, as the motivation was to work with a homogenous group of women as an intervention to stimulate thinking innovatively and raise awareness of alternative work and workplace design. It hence appears as if this respondent accepted the idea as one way of thinking differently about thinking innovatively.

Another of the project participants had similar reasoning as in the previous statement, saying that it was really nice to be in a group with exclusively women for once, but nevertheless stressed:

“It is important that it does not become a “women-against-men” attitude, but to have the attitude that we have to work in different forums to come up with different perspectives. It is really good that you also worked with young people, that was inspirational” (Quotation from follow-up interview 2011)

In this quotation, the respondent’s awareness of “coming up with different perspectives” for thinking innovatively about industrial work and workplaces is an important aspect. Particularly so, in relation to the previously-mentioned traditional decisions and planning processes being conducted by only a few people based on their own subjective understandings (Simon, 1997).

In the interviews, we discussed various approaches to thinking innovatively and raising awareness, both inside and outside the industrial sector. Whereas I cannot give whole credit to the Future Factory project for this awareness of the need to address different perspectives, I consider it a vital aspect in thinking new. Due to the activities that preceded those interviews, it should be noted that those respondents may have felt more comfortable discussing the subjects as well as uncomfortable about criticizing the approach and methods.

## **OBSERVATIONS**

The observations in the current work were mainly performed with the intention of better understanding various industrial contexts. Hence, the reason was a preparation for the collaborative activities with industrial sector actors. Two sites for observation were therefore selected, since these were the places of work for some of the succeeding participants. One additional site was chosen, since various people referred to it as a 'dream factory'.

Similar to Jungk (1987) and Ehn and Sjögren (1991), I consider observation to be an important part of preparations for participatory research. Participatory observation is an ethnographic method, often undertaken over a time frame of several months and sometimes even over years to provide a rich understanding of a culture or a social system. This is what generally is known as an aspiration to "go native". As Jones (1970) describes, in contrast to being an 'outsider', the intention of studying a particular context is to be an 'insider' who undertakes research on a group of people of which s/he is a member.

However, the objectives with conducting participatory observations in anthropology and design differ. Blomberg et al. (1993) for example stress that while the method is often used in anthropology for increasing understanding of human behaviours, it is used in design research as input for the subsequent design process. Consequently, it often seems to be applied in a less rigorous and comprehensive manner as short-term interactions to provide contextual insights.

## **OBSERVATION AS CONTEXT MAPPING**

The objective of applying the Observation method in the Future Factory project was to use the gained knowledge and understanding of different industrial contexts as input material for the upcoming Personas, scenarios and workshop activities. The visited sites were both process- and manufacturing industries, and the observation was undertaken in the form of half-day to full-day visits with an accompanying person from the company explaining the processes and activities. During the observation sessions, I was able to talk to employees and discuss their context first-hand as well as second-hand with the accompanying person.

One concrete aspect that might have been overlooked without the observations was the increased use of agencies for parts of industrial work. When I observed that some of the workers did not

have the same work wear, I got the answer “*..they don't work here, they are just hired to do a job*” (Observation 2008). In the following discussion I understood that the hired firm did not follow the same strict safety regulations as this company did, and that the in-house personnel had rather mixed feelings about the agencies. During another observation, one of the workers said that more external personnel performed work at this place, however concluded that it was fine as long as they work on the ‘bad’ jobs. Similarly, in one of the interviews, a respondent said that “*...they (the external personnel) are not invited to the coffee breaks, they might take our jobs!*” (Interview 2008). This illustrated an interesting aspect of industrial work that I wanted to further address in the project, and also illustrates the usefulness of combing interviews and observations as methods for context mapping.

Thus, in the observations I was able to observe and ask with the intention of understanding the whole of the system; relations between different parts, interactions between people, actions and tasks, and how they were linked in the processes. These activities were not recorded, although some interesting aspects were written down as field notes.

Whereas this material was not analysed or considered as principal research material, it did provide a contextual understanding that was very useful for understanding other sections of the research material. I was allowed to take photos during some of the visits that were used both in later activities as associative images and as ‘recollection material’ of the observations. Actors in photos were asked beforehand and said they were willing to participate as ‘research material’. Photo 1 illustrates some of the project activities.



Photo 1. Workplace observations and future workshops. Photo: Åsa Wikberg Nilsson

## THE RELEVANCE OF INTERVIEWS AND OBSERVATIONS

The relevance of interviews in the current research work can be questioned since an action-based approach generally includes actors partaking in the research work. Such an approach traditionally integrates actors in a two-way communication, meaning that the participants are not solely answering researcher's questions but also have the possibility to raise new questions and guide project objectives based on their own interests.

There is also the question of the contribution being useful, meaning that the research participation should provide something to the collaborators as well (Svensson & Aagaard Nielsen, 2006). Whereas the argument can be raised that the interview is useful for the respondent in terms of reflection on certain phenomena, in the current work the interviews were part of the preparation and follow-up activities. The material from the preliminary interviews was used as input to the collaborative work, as examples of various experiences and perceptions, and as material for the succeeding development of Personas. Furthermore, the current research was not a clear-cut action research project, as it did not involve an actual work practice, but nevertheless was inspired by such an approach.

There is also the criticism of scientific validity, for example in the question of bias and objectivity in interviews. As I see it, the intention was not for the interviews to provide an unbiased or 'objective' material. The question of bias for me seems to be a question of how to address the research interests. In the current case it can be exemplified with the issues of being a woman in the industrial sector that were prompted by questions of experiences of work colleagues and work situations, rather than asking primarily about, for example, gender issues. The reason for this is that most people do not seem to consider certain situations as unequal structures, but refer to them in terms of individual short-comings (Kanter, 1993). Asking primarily about what some women and men often consider as 'problematic women's issues', can thus be just problematic. Rather, in the interviews I strove to make the respondents feel comfortable with the questions and asked follow-up questions on interesting subjects. Moreover, I follow similar reasoning as Kvale (1996), stating that some questions must be leading in order to lead to learning more about the specific research interests.

Hence, the intention of the preliminary interviews was to learn about some experiences of being a woman working in the industrial sector. I draw on Acker (1999), in relating the whole experience of work as dependent on organisational structure, interactions at workplace, the symbolic perception of the workplace and the work tasks, in the construction of the individual attitude towards the work and the workplace. Therefore, interviews are always subjective in the sense that someone else might perceive differently an issue or a situation that seems 'true' to the respondent. Relevant in this aspect is Dewey's (1998b; 1998c) notion of 'experienced realities', meaning that there are a variety of experiences that are equally 'real' to the actors involved. Understanding human experiences in this view always means involvement in subjective perceptions. Qualitative interviews in design projects can hence be seen as ways of obtaining stories from the people concerned, stories that provide deeper understanding of some experiences of the situation that is explored.

The question of the validity of observations can also be relevant to discuss briefly. The intention was not to be a "fly on the wall" and observe what people were doing. On the contrary, we talked to people and explained the reasons for us being there. Our presence of course affected the work, people seemed very aware of our presence. As the intention was to get an overall understanding of contexts and as we were seriously interested in their work situation, it however seemed as if they appreciated the interruption. The essence of undertaking observations hence is to understand the 'language-game' (Wittgenstein, 1992), that is, to gain better understanding of what people do, how they do it, and how they make sense of the phenomena explored.

In the current work, both the interviews and the observations were conducted as part of the inspiration and preparation phase. In my view, both methods provided a lot of inspiration for the upcoming collaborative activities. Therefore, I consider Interviews and Observations as valid methods for the current research.

## 4.3 REFRAMING EXPERIENCES AND PERCEPTIONS

As the main objective with my work was to probe change by design, I naturally drew inspiration from design methods. A frequently applied design method is *Personas*, a term coined in this respect by Cooper (1999). He refers to a Persona as a fictional description of a person, whose characteristics are relevant to the project it is designed for. Likewise, the *Scenario-technique* is well known for stimulating thinking of how it could be (Carroll, 2000). Both of those methods are described in the following.

### REASONS FOR USING PERSONAS

Like Nielsen (2004), I consider the main reason for using a Persona in to be to focus on users' needs and preferences. In the present project, this involved emphasis on various experiences and values held by the people working in the industrial sector, and by the people that might be working there, in the future. The reason for using Personas in the current project can be seen as involving criticism of some traditional development processes focusing on emerging technology rather than the people who are going to use the subsequent technology, tools, environments or systems. This can be exemplified in Cooper's (1999) statement of using Personas as a way to move away from the 'false' focus on the system, to the users, that is, the people who are going to use the system.

Using the Persona method can also be seen as a natural human behaviour. In this I draw on Grudin's (2006) account of humans naturally and unconsciously making thought models of how other people will behave or what attitude they will have. He further exemplifies with engagement in the life worlds of fictional characters in TV-series, movies or books. This is illustrated in the following quotation:

"When we argue about what characters did after the action in a book or movie ends, we have internalized and animated the characters, just as we would like designers and team members to internalize and animate Personas as a step in anticipating the behaviours of future users" (Grudin, 2006 p. 644)

I follow Cooper's (1999) argument for using the Persona method, exemplified in this project as getting better commitment and understanding of various 'user' perspectives among the project participants. I also agree with his point that an ideal Persona process should include continuous discussions in the project team of the Persona's objectives, needs and values. In this, the underlying main objective of using the method is illustrated as achieving design outcomes that better satisfy the target user groups. Hence, the reasons for using Personas in the current study were twofold: Firstly to have various 'user' perspectives in focus during the project, and secondly to highlight the value of emphasizing human experiences to project participants.

The reason for using Persona characters can also be associated with Ehn and Sjögren's (1991) use of images, which are referred to as social constructions of a reality that creates common understanding among participants. Personas are constructs, since they are fictional characters in specific contexts. However, the base in a Persona is research material from preliminary inquiries. Therefore, the Personas can be seen as communication objects that transfer some of the 'stories' of people working in industrial sectors.

The Persona method's contribution to communication and discussion of various future scenarios is an additional aspect I consider to be vital for design practice. This can, for example, be exemplified as to achieve a deeper understanding than provided by statistics of aspects such as user experience, behaviours, goals and situations of use. For this reason, the underlying motive for the use of Personas concerns qualitative characteristics, which can be exemplified as a search for understanding of what would provide value in the user's future life worlds.

Grudin and Pruitt (2002; 2003) and Pruitt and Adlin (2006) refer to creating Personas based both on quantitative and qualitative materials, drawing on statistics, surveys, interviews, observations, focus groups and workshop activities in mapping and analysing the target user group. The fictional details of the Persona are then added in order to increase communication of and commitment to the Persona character.

In the current work, the motivation for developing Personas was partly to communicate various experiences and perceptions of working in the industrial sector between the participating interest groups. The idea was to develop a number of Personas that addressed various 'user' situations identified in the preliminary interviews and observations, and communicate them among participants.

## PERSONA DEVELOPMENT

There is no clear-cut description of how to develop a Persona. However, it is often described as an iterative design process of mapping, contextualizing, and creating characters (Cooper, 1999; Grudin & Pruitt, 2002; 2003; Nielsen, 2002; 2004; Pruitt & Adlin, 2006).

Grudin and Pruitt (2003) describe the creation of ‘foundation documents’ that form the basis of a Persona. The documents include descriptions of what the following design process should focus on and what the study therefore should search for. For example, understanding values, concerns, experiences, impact on business, attitudes, interactions and desires. Whereas I have seen examples of Personas that consist of a picture, a name, age, and only a short description of a specific product-related situation, a foundation document in my view provides the basis for a richer Persona development.

The foundation document can be seen as a way of organizing research focus and structuring a research material before developing the fictional character. Thus far, the method appears as a variant of a ‘contextual inquiry’ (Holzblatt & Beyer, 1993; Beyer & Holzblatt, 1997), or a different, communicative and visually attractive way of presenting research material, for example from interviews and participant observations. Additionally, I consider the content of a foundation document to illustrate the principal of explorations of user values and usage experiences. For example, this is illustrated in Grudin and Pruitt’s (2003) expressions of to “get to know” and to “get a sense” of the user. As I understand it, this is very different from traditional workplace development, which focuses on measurable factors, for example of height and space.

The next step is to develop a narrative scenario that provides a deeper understanding of the Persona character. Like Grudin and Pruitt, I emphasise the focus on likes and dislikes, goals, attitudes and frustrations in the context. In traditional industrial workplace projects, the focus seems to be on the production process, rather than the experience of the people in the workplace (Johansson, 2009).

Thus, the Personas in the current work were given characteristics such as fictional names and images to illustrate the characters, overall attitudes towards life, work and the situation designed for, and so forth. This is aspects or Personal traits that are

included to bring the Persona to life and create what Nielsen (2004) refers to as an engaging character. The scenario creation is presented as an important part of creating commitment to the Personas. For example, Nielsen relates this to characters in movies and books rarely being presented by a list of characteristics, but rather in terms of specific situations of use, or by the character's interactions. To further exemplify engaging characters, Nielsen illustrates with the following example from the beginning of the film script to the movie *Thelma and Louise*:

"Thelma is a housewife. It is morning and she is slamming coffee cups from the breakfast table into the kitchen sink, which is full of dirty breakfast dishes and some stuff left over from last night's dinner, which had to 'soak'. She is still in her nightgown. The TV is on in the background. From the kitchen we can see an incomplete wallpapering project going on in the dining room, an obvious 'do-it-yourself' attempt by Thelma" (Nielsen, 2004 p. 137)

Like Nielsen, in presenting this film scenario, I stress the story as the foremost vital aspect of creating commitment to the Persona, because without an engaging scenario the Persona becomes a 'flat stereotype'. In the film script, the details of the character Thelma are not explicitly set out, for example, there is no detail of age, gender, or goals. Yet, to me at least, this short extract provides details of Thelma's attitude, her behaviour and the context she is in. Such characteristics can provide a better ground for commitment in the Persona, and thereby for better understanding the needs for the future artefact.

For the above-mentioned reasons, it seems as if the Persona method can be used in different ways, which can almost be considered as different methods. I would say that this ranges from more static descriptions, such as short lists of name, age and technology use, to the creation of dynamic characters in scenarios. However, Personas are mainly used for the development of systems, technology and products. As of yet, I have not come across a usage of the method for emphasizing diverse human experiences and perceptions in work and workplace design, or as a tool for thinking differently about thinking innovatively.

## **PERSONAS USED IN THE PROJECT**

The ambition in the preliminary project phases was to form an understanding of industrial contexts and their actors, in the sense of people working in the contexts. In addition to this, I used empirical

material from a previous case study performed in the Swedish manufacturing industry by one of the project team members (Abrahamsson, 2000; 2009). This overall preliminary mapping provided a rich bank of experiences of working in varying industrial contexts, both first- and second-hand information. The first-hand information came from interviews and observations. The second-hand information was through a research colleague's transcribed interview material.

At this stage, the research team members jointly chose to address the following emerging situations: 1) The outsourcing of some work tasks that can contribute to work safety and work environment issues, 2) the gender segregation of work and work tasks within some industrial firms, and 3) the situation of young people opting out of industrial work. These emerging situations formed the basis for the three Personas that were named Anna, Dan and Eva, as illustrated in Figure 11.

Obviously, these situations reflect the research objectives of particularly emphasizing women's and young people's needs and preferences, but also the emerging issue of safety at work and working environment aspects in some outsourced industrial tasks, as noted in the interviews and observations. These were hence situations that the research team wished to communicate and discuss with participants during the subsequent collaborative phases. The ambition was to create Persona characters that contributed to critical reflections about practice and that could support communication of various experiences within industrial contexts. The next step was to make scenarios that described the Personas' work situations and find images to illustrate the characters and make them "come alive".

The Persona development was a continuous process, since I discussed the Personas in various collaborative activities and updated the information during the project period. This also included a re-thinking of the method, some halfway through the project period. Using the Personas as tools to create gender-awareness is somewhat problematic, as the Personas are presented as either a woman or a man. Thus, in collaboration with a research colleague, I probed a re-design of the method. As previously mentioned, the Personas are based on research data. However, in the new approach, we reversed the gender of the Personas that were based on the empirical data, but otherwise kept the scenarios intact. The re-design of the method is further described in the appended Paper 4, and visualized in the Result chapter of this thesis.

	Persona 'Anna'	Persona 'Dan'	Persona 'Eva'
Interest group	Anna (young woman )	Dan (young man)	Eva (middle-aged woman)
Participants	Shop-floor worker, assembly line, work team	Maintenance work for agency	Shop-floor worker, assembly work
Relation to project	Large scale manufacturing	Within large scale manufacturing	Manufacturing
Leisure activities	Hang out with friends	Motorcycling	Family
Goals, fears, and aspirations	Works to earn money to be able to travel, some worries of occupational injuries	Works to earn money for his hobby, does not worry about occupational injuries	Want change at work, fear of occupational injuries
Work skills, knowledge	Two weeks of introductory training, six months further training	No training, learned from colleagues	No training recent years
Influence	Daily team meetings, low influence	Daily meetings, low influence	No organized meetings, low influence
Attitudes	Wants challenging work tasks, travel and experience 'things', do something good for humanity	Don't mind hard and challenging work tasks, but do not want to work with this forever	Upset about re-organization not resulting in change
Interactions	Team of 13 people (one woman)	Works in small teams	Works with assembly work tasks, all women
Considerations	- Industrial work is more high-tech today than before - Stressful and monotonous work tasks	- Low interaction with in-house personnel, considered a 'threat' -Hard and stressful job	-On half time sick leave for occupational injury - Monotonous work task
Quotes	"Its not like it is brain surgery, your learn quickly and then there is nothing new" (Interview 2008)  "I had to fight to get that further training/.../No woman had done that before" (Interview 2008)  "Its not like its a job worth to die for" (Interview 2008)  "Stationary ergonomic equipment at an assembly line, what are they thinking?" (Interview 2008)	"We don't invite them to our coffe breaks, they might take our jobs!" (Interview, 2008)  "They don't work here, they are just hired to do a job" (Observation 2008)	"It is only women working with assembly, I don't know why." (Observation, 2009)

Figure 11. Persona foundation document for the Future Factory project.

## **SCENARIOS**

Given the objective of probing change and reframing mind-sets, the Scenario technique is another way of spreading awareness of possibilities and hence thinking innovatively.

Carroll (2000) describes scenarios as stories of people and their activities. As the research objective deals with emphasizing human experiences in change by design, this seemed like a valuable method to apply. Carroll further describes scenarios as stories that are used instead of lists of requirements, as a direct approach to explicitly illustrate and document typical and significant user activities, early and continuously in the development process. Scenarios are also used to support reasoning about various situations of use, even before those situations actually arise (Carroll, 2000). In my view, this makes the Scenario method relevant for probing change.

Scenarios are widespread in the design of information and communication systems. But, to my knowledge, the Scenario method is rarely used for work and workplace design. Still, I considered the description of using scenarios for understanding and creating systems and applications in relation to human experience as equally relevant for work and workplace design.

Scenarios were used in the Future Factory project in the Persona descriptions, but they were also used as tools for challenging mind-sets. The aforementioned dissociating attitude among some young people towards industrial work and workplaces was in the current study seen as a motive for involving young people in the research, with the aim of better understanding their attitudes towards current industrial work and their preferences for future work.

As is the case for women, young people are certainly not a homogeneous group with one attitude towards industrial work and one preference of future workplaces. However, the idea was to have a group of young people developing future scenarios that could be used in the other collaborative activities.

## **FUTURE SCENARIO WORKSHOP**

Future Scenario Workshops are basically Future Workshops with the inclusion of Scenarios. As Scenarios is a method that can be undertaken, for example, as written narratives (Carroll, 2000), acted role-plays (Brandt, 2006), or filmed sequences that are explored during a workshop session (Johansson, 2005), the first

decision was what kind of approach that was relevant to the interest group of young people.

Another initial question was the young people themselves. If students from the local vocational industrial programme in upper secondary school were chosen as participants, I considered that they would already have a pre-understanding of the current industrial work situation. In contrast, the decision was to contact a programme that has low association with the industrial sector. Consequently a group of young people were chosen, who already had opted out of the industrial sector as a future workplace, at least temporarily. For this reason, I contacted a social science class at a local upper secondary school, and invited 23 students aged 17 to 18 years to participate in the project. The assumption was that those young people did not have any experience of work in the industrial sector.

After an initial presentation of the project, I asked them to select an image, and write down their immediate reflections of that image on a piece of paper, see workshop in **Error! Reference source not found.** Initially, they took some time in selecting images, picked an image and started to write down their reflections on the images. After some time, they formed groups and discussed the questions concerning what they considered to be an ideal workplace, good work tasks, and so forth, in relation to their reflections over the images. Fairly early, it was clear that some of them had a somewhat negative opinion of the industry sector, which was illustrated in statements of industrial work being 'boring' and 'monotonous', and industrial workplaces being 'dark' and 'dirty'.

The subsequent task was for them to use text and images to describe their individual future scenarios of work and workplace, as if it were to take place in a future factory. The intention was to get a better understanding of these young people's values of work and their visions on how it ought to be in an ideal future factory. Still, some were bothered by the task of describing their ideal job in an industrial context. Consequently, some of them realized their negative perceptions by writing dystopic future descriptions of what the future would be if they worked in a factory. The outcome of the workshop was a variety of individual scenarios of which some describe visions, and some describe concerns. Some were even descriptions of both these scenarios, in the sense that they first described what the ideal ought to be, and then declared concerns for the future in what was expressed as the most realistic scenario.



Photo 2. Photos from the Future Scenario workshop with young people in 2008. Photo: Åsa Wikberg Nilsson

## **IDEALIZED FUTURE SCENARIOS**

The intention with the young people's scenarios was to use them in other collaborative activities in the project, to communicate these young people's ideas of how a future factory should be, and possibly widen awareness of alternative perceptions.

In the content analysis of the scenarios, the overall emerging pattern was of either a pessimistic or an optimistic future factory scenario. Consequently, the idea was to communicate them as two future scenarios, which could be described as similar to Weber's (1983) concept of 'ideal types'. This is described as refinement of one or more aspects in an empirical material that is refined until certain phenomena can be classified. The ideal types are therefore theoretical constructs that do not exist in their pure form in the 'real' world. However, they are said to be valuable constructs for exploring and explaining certain aspects of reality and for revealing discrepancies that need further explanation (Weber, 1983).

Ideal types should therefore, as I understand it, be seen as a tool for constructing knowledge, that is, as a tool for characterizing and describing certain phenomena. In the project I listed aspects that seemed important in the scenarios as visions and concerns, see Figure 12. For this reason, all concerns, fears and negative associations described in the young people's scenarios were summarized in a more cynical future scenario called 'Dystopia'. Accordingly, all hopes, desires, and visions were summarized in a more ideal future scenario called 'Utopia'. These scenarios are the result of the analysing process, although all the details come from the young people's scenarios. Therefore, those scenarios are neither real, as in originating in only one of the young people's scenario, nor do they present reality, since they are accounts of visions and concerns. However, they illustrate the possibility of revealing phenomena of the real world. Thereby, the idea of using them was as tools that stimulate reflection.

	Visions	Concerns
<b>Ideas of Future Factories</b>	<p>"A factory full of life and joy"</p> <p>"Feels good to go to work in the morning"</p> <p>"In a big city "</p> <p>"Parks and green areas"</p> <p>"A community built around the workplace"</p> <p>"Environmental friendly"</p>	<p>"Factories only emit toxic pollutants"</p> <p>"Dark sky, dark environments, dark premises"</p> <p>"As factories are today, it can only get worse"</p> <p>"Factories destroy our earth"</p> <p>"Factories only reflect humans' selfishness"</p>
<b>Ideas of work</b>	<p>"Automated production"</p> <p>"Monitoring work"</p>	<p>"Only robots, no humans needed"</p>
<b>Ideas of workplace</b>	<p>"Design and work environment are important for the employees to feel comfortable"</p> <p>"Bright and airy space"</p> <p>"Considerate design"</p> <p>"Transparency both in organization and at the workplace"</p> <p>"Privacy, I like to have a private space"</p>	<p>"Dark and dirty working environments"</p> <p>"A huge warehouse with a large chimney"</p> <p>"In a developing country-workers would be happy despite bad work environments and unsafe work tasks"</p>

Figure 12. Presenting some of the visions and concerns of the young people.

## REASONS FOR SCENARIOS

As in the description of Personas as a natural human activity, most people have at some point practised the process of mentally placing themselves in a hypothetical scenario and imagining what would happen. Recognition of the ability to imagine future situations is not a new experience. For example, the philosopher Immanuel Kant (1724-1804) once stated that:

“Recalling the past (remembering) occurs only with the intention of making it possible to foresee the future; we look about us from the standpoint of the present in order to determine something, or to be prepared for something. Empirical foreseeing is the anticipation of similar cases (*expectatio casuum similium*) and requires no knowledge of causes and effects, but only the remembering of observed events, as they usually follow upon each other. Repeated experiences help to develop skill in empirical anticipation” (Kant, 1978 p. 77)

Probing the future through exploring scenarios can, therefore, be seen as a preparation. As reflection on past experiences can be seen as providing learning, future prospectations can be seen as an opportunity to pre-experience or ‘prototype’ the future. For example, Carroll (2000) describes one reason for using scenarios as helping to understand and create systems as objects of human activity. As such, the scenarios are things to learn from, and use, in interactions with other people.

My ambition was to discuss various future scenarios with the project participants, and to use the young people’s visions and concerns to challenge and provoke other project actors, as further described in Paper 3. Miles and Huberman describe another reason for using scenarios as:

“Qualitative data organised into incidents or stories, have a concrete, vivid, meaningful flavour that often proves more to a reader - another researcher, a policymaker, a practitioner - than pages of summarized numbers” (Miles & Huberman, 1994 p.1)

Although not using the term scenarios, the reason for presenting empirical data as narratives can be as objects of communication. Therefore, communication can be one reason for using scenarios.

Furthermore, according to van der Heijden (2005), scenarios can assist in expanding ‘mental models’, that is, mind-sets, as a means to cut across disciplinary boundaries. His view in this is that an understanding of the world is always partial, depending on things such as upbringing, education and experiences. Thus, he

stresses that until assumptions are compared to other people's perceptions, people are not aware of having limited 'mental models' of the past, the present or the future. The objective in this view is to explore possible future situations that could impact individuals, organisations, or societies. He continues by explaining the philosophy of scenarios as thinking proactively and planning for the future instead of being a passive victim of change. In line with this description, I consider an important reason for using the Scenario method to be to respect differences, and therefore to encourage multiple perceptions of current and future situations.

Additionally, the Scenario-based Design approach generally involves explorations of various usage situations, and thereby can be a contribution to thinking innovatively. For example, Schön (1983) describes a scenario as a restructure of the current situation in order to provide new insights through the restaging of a situation. In design processes, therefore, the scenarios can be seen as his idea of "objects to think with", as a material that talks back to the designer. However, in the current case, the scenarios were applied as objects that were intended to "talk back" to the project participants.

## 4.4 FUTURE IMAGINATIONS

In this section I describe the methods in the collaborative activities of the current research. Those phases involved workshops with a variety of people. In the second stage of the project stage the interest groups industrial management and employees, trade unions and young people were invited to participate. Robert Jungk coined the concept of *Future Workshops* (Jungk, 1987; Jungk & Müllert, 1989), which was the inspiration to the collaborative activities in the current research. In the final project phase, a team exclusively comprising women worked in a series of workshops with the material from the other groups, as well as their own ideas, concerns, needs and preferences, to create visions of work and workplaces in a future industrial context. The approach, method and tools applied in the collaborative activities are further described in the following sections.

### FUTURE WORKSHOPS

Jungk is sometimes referred to as a ‘social inventor’, probably because of his strive to create the Future Workshop method in which a diversity of actors collaborate in dialogues, both on the present and on the future. The Future Workshop approach is by his own words a social innovation, as it involves people in thinking innovatively about what kind of future they would like to have (Jungk, 1987).

In *Håndbog i Framtidsverkstaeder*<sup>17</sup>, Jungk and Müllert (1989) describe the Future Workshop method as a process of four stages or phases, where each one lasts from a few hours to several days. This approach was a major inspiration for the Future Factory project. However, the actual procedure differed between the project workshops, since the probing of various methods and tools changed between the workshops.

The project objective of developing a vision of the Swedish industrial context, without addressing a single organisation, work practice or workplace, also made a final phase of actual realization or implementation difficult. Instead, the realization phase in this project involved developing a vision of a future factory. The

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<sup>17</sup> Handbook in Future Workshops (author’s translation) (original title *Zukunftswerkstätten, Wege zur Wiederbelebung der Demokratie*, 1981)

workshops in the current project lasted from half a day to full days interventions, each session involving between 5, to 23 external participants.

I conducted some of the workshops myself, but in most of the activities I facilitated the workshops and some colleagues acted as participating observers. Most workshops were video-recorded and/or audio-recorded in order to take quotations from the discussion as well as to be able to study participants' self-expression through whole-body language.

## **PHASE 0 PREPARATION**

The original description of the first preparation phase consists of the development of a workshop theme, and the selection of participants, who Jungk and Müllert (1989) refer to as each and every interested party. Like them and like Ehn and Sjögren (1991), I also proposed to include observations of the context that is to be explored prior to the workshops.

In the current research, the preparation involved the previously mentioned interviews and observations and the subsequent development of Personas and Scenarios. The selection of participants for the subsequent workshops was another preparation issue. Thus, the main reason for the preparation phase in the current study was for me as the workshop facilitator to better understand the context and the practice and thereby be able to improve methods, tools, and processes.

The preliminary phase provided me with an increased knowledge and understanding of industrial contexts, and it also provided some of the materials used in the subsequent workshops. For example, images used in the workshops was from the observations, the Personas were developed based on the overall preparation material, as well as some of the other 'boundary objects'<sup>18</sup>.

I emphasise that the workshop facilitator plays both an 'outsider' and 'insider' role: An outsider in the sense of being able to question and challenge some of the internal stakeholders' perspectives and practices, for example, asking 'naïve' questions, an insider as being able to grasp the participants' discussions and ask follow-up questions on interesting aspects.

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<sup>18</sup> 'Boundary objects' are things that act as means of translation. They can be any object that is open enough for different interpretations, yet their structure can be perceived differently by various individuals or social groups (Bowker & Star, 1999).

## PHASE 1 EXPERIENCES - "WHAT IS"

The first actual workshop phase was originally formulated as the critique phase (Jungk & Müllert, 1989). Drewes Nielsen frames this as the mind-set: "*We are consequently negative*" (2006 p.103). The structure of the traditional set-up follows a brainstorming session, in which short statements are written on post-it notes, and are governed by rules, such as "no critique of statements", "all statements are being allowable", and "as many ideas as possible". Eriksson (1991) however refers to this phase as the experience phase. The relevance seems to be in the human experiences; participants are reflecting on their various experiences and usage situations, and are subsequently making statements of the situation discussed.

In the current study, the first workshop with trade union representatives was conducted with an experience phase instead of a critique phase. To stimulate both individual and collaborative experiences, I was inspired by Rehal's description of '*associative images*' (Rehal, 2004; Rehal & Birgersson, 2006). The use of images to initiate individual and collaborative reflection were used in several of the workshops, see Paper 2. The discussion started off in a rather polite manner, but as the participants started to discuss their experiences it seemed as if frustrations of their present states took over. Thus, it was obvious that the critical phase should not have been excluded from the workshop approach, as the participants in reality undertook a critical phase in the discussion of some existing industrial contexts. Being trade union representatives their task is obviously to play a somewhat critical role. The 'free space' for discussing experiences and reflection of 'what is' seemed as something they were comfortable doing and to which they were committed. The Future Scenario Workshop with young people had a similar initial approach, as the trade union one. However, in both of those workshops, as the participants criticized current experiences of practices, they undertook what could be referred to as a phase of negative statements.

Based on this earned insight, I subsequently changed into the traditional critique phase in the two subsequent workshops with industrial employees. As it turned out, these actors were surprised about only giving negative critique. In the first of these workshops, I initially asked them to describe an experience that had somehow been influential in their work life. This is similar to what Flanagan (1954) refers to as *the Critical Incident Technique*. The intention is for participants to describe an event that somehow seems significant for them, either negatively or positively. Reflective questions can hence

assist in identifying critical incidents. The following are some examples of such reflective questions:

- Think of a specific work situation when you felt encouraged – why?
- Think of a specific work situation when you felt neglected - why?
- Think of a particular work environment you really like – why?
- Think of a particular work environment you really loathe – why?
- Think of a certain work tool that is valuable for you - why?
- Think of a certain work tool that is worthless for you – why?

Hence, the participants reflected on experiences of work situations, work environments and work tools, both positive and negative ones.

In the workshop with participating actors from two companies, I planned and conducted the workshop in collaboration with another research project's team members<sup>19</sup>. In this initial planning, we jointly decided on a first phase of associations. Hence, this phase included associations to the words 'factory' and 'industrial worker' written down on post-it notes. The associations had both negative and positive characteristics and the participants in this workshop were subsequently asked to group and theme the various statements.

The first workshop with the interest group exclusively consisting of women was themed 'what is'. Hence, I returned to an experience phase to explore the present states. In this workshop, the participants were able to give both negative statements and future project expectations.

Consequently, in the various workshops the initial phase was changed from critique to experience, and then reversed in the final phase workshop. It is difficult to draw general conclusions which approach is the better, since the participants were different in each of the workshops. However, to discuss the initial phase in terms of experience could include both negative and positive individual and collective experiences. I consider this initial phase to involve both individual and collective reflections on what experiences to present, and thereby to stimulate reflective mind-sets.

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<sup>19</sup> This activity was planned and conducted in collaboration with a research project managed by industrial designer Marcus Jahnke (Business and Design Lab, Gothenburg, Sweden), in which fashion designer Charlotta Schill collaborated, see Jahnke and Loft (2011).

## PHASE 2 IMAGINATIONS- “WHAT COULD BE”

Jungk and Müllert originally framed the second phase as the Fantasy Phase or merely ‘Utopia’. This is framed in the mind-set of: *“Reality is out of function. We are situated in a perfect world, where everything is possible”* (Drewes Nielsen, 2006 p. 103). The traditional structure of this phase is similar to the previous: A brainstorming session in which groups are formed around the themes from the experience phase, and afterwards this group formulate ideas and visions of the themes.

In the first workshops the second phase was conducted similarly to the previous phase. This meant that participants were prompted to select an image that best reflected their individual association of an ideal future factory, and then discuss their reflections in groups. The use of images as ‘boundary objects’ or ‘probes’<sup>20</sup> seemed to stimulate thinking innovatively. As the participants themselves afterwards said, this was different from their previous experiences and therefore really supported reflection. In the workshop with the more traditional Future Workshop approach, the Utopia stage was applied to develop solutions based on the previous themes. The participants were prompted to bear the critical incidents in mind when they developed desired solutions, based on the idea of creating solutions based on experiences and perceptions. This approach also seemed to work, as they developed a lot of solutions for their future work and workplace. It is however important to note that in this workshop, the participants came from one company, and hence developed solutions based on a particular context.

Design space exploration with exclusively women involved discussions and reflections of the previous workshop outcomes. They initially worked with various statements from previous workshops and formed them into themes. The ambition was to encourage thinking innovatively, as other interest groups’ ideas and statements would possibly stimulate them. Subsequently, they developed a future scenario for a Persona, a character that the project outcome would satisfy. The idea was that this Persona scenario would be a probing of work and workplace design that emphasises human experience in addition to technology or process development.

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<sup>20</sup> Probes: here defined as a materials meant to stimulate inspirational responses from people, that is, not comprehensive information, but ideas and thoughts about their experiences and desires (see e.g. Gaver et al., 1999).

### **PHASE 3 IMPLEMENTATION - "HOW CAN THIS BECOME REALITY"**

The third phase of the Future Workshop is referred to as the realization phase or the implementation phase (Jungk & Müllert, 1989). The mind-set in this phase is described as: "*We keep our wishes and dreams, how can they become reality?*" (Drewes Nielsen, 2006 p. 104). In this phase the participants are supposed to return to the present, and identify obstacles and implications for realizing the visions from the former stage. However, in most of the activities in the current study, the inclusion of a variety of stakeholders from different companies and contexts, made a realization phase somewhat difficult. For that reason, most activities ended after the previous Utopia stage, when visions and future scenarios were created.

In the design space exploration exclusively with women, the fourth and final workshop was themed realization, as a phase of realizing the vision of the future factory. I had observed it to be difficult to move beyond the present state and thinking outside the participants' own practices and therefore wished to stimulate those actors to realize all the discussions and ideas from the previous stages as concrete visions. Therefore, they were divided into three groups working with the future factory workplace, the future factory technology and communication system, and the future work organisation.

Additionally, I had the idea of working with a holistic perspective of the whole work system in all of the groups. For example, I agree on Lewin's (1951) emphasis on Gestalt theory, and with Schön's (1973) discussion on how change and innovation in one aspect of a work system contribute to an imbalance of the whole stable state. Thus, the participants worked with parts of the work system, but were prompted to bare the whole in mind. An additional reflection from the previous workshops was that there was much discussion but little action. To stimulate creativity, I therefore prompted them to sketch solutions, to cut out images of magazines, to make simple models, or to otherwise visualize their visions. The action of performing design seemed to nurture creativity. Some of the activities in the current study are visualized in Photo 3.



Photo 3. Design space explorations with women exclusively. Photo: Åsa Wikberg Nilsson

## **RELEVANCE OF DESIGN LABS**

The design lab approach in the collaborative activities was inspired by the Future Workshop method. The relevance of this method in the current research can be motivated by the objective of probing an approach to work and workplace change that participants could implement within their own businesses. This methodology I would describe as easy to grasp, realize and embark within most businesses.

The ideology of Future Workshops involves an intertwined practical theory of collaborative action for change. Jungk's (1987) idea was that it is necessary to involve a variety of people, all those that are concerned, in probing change to reduce concerns and suspicions. Likewise, in the current approach of probing design, the ambition was for the participants to experience an alternative, reflective design lab approach. In line with Jungk's ambition, the motivation was to reduce concerns, as I believe that such an approach can contribute to alternative solutions that increase value in various respects.

Thus, the 'design lab' approach can be seen as several interventions that were initiated by us as researchers, but on which the participants can decide whether or not they will take action. Like in Drewes Nielsen's (2006) description, I see the main outcome of the collaborative activities as enabling people to work with dreams and imaginations of what could be. Likewise, I agree with her statement that the objective is some kind of change, because the incentive is to question and challenge present states.

The relevance of this, as I see it, is that it can likewise involve a mental change of actors' mind-sets, as a physical change of a certain context. This seems to be the main point of Future Workshops, and therefore it seemed ideal for the project idea of 'design labs' as arenas for probing change and widening awareness of possible courses of action.



# 5 SUMMARY OF APPENDED PAPERS

This dissertation is based on four appended papers, further described in the following sections, and outlined below. As the current work was undertaken foremost in the Future Factory project, all papers concern various aspects of this project. For example, the inspiration drawn from design is described in Paper 1, the Persona approach and the Future Workshop method are further outlined in Paper 2, and the Scenario-based Workshop approach with young people in Paper 3. The fourth paper deals with the rethinking of the Persona method into Switched gender Personas and the merger between design and gender theories.



# OUTLINE OF APPENDED PAPERS

PAPER	ACTIVITY	METHOD	RESULTS
<b>PAPER 1</b> Reflection-for-action: a collaborative approach to the design of a future factory	Workshops with interest groups	Personas Scenarios Future Workshops	Emphasis on human actors in design of work and workplaces Principles for reflective design of work and workplaces  Collaboration as means for thinking innovatively in work and workplace design
<b>PAPER 2</b> Reframing practice through the use of personas	Context mapping Persona creation Workshops with interest groups	Interviews Personas Future workshops	Emphasis on reframing mindsets Principles of critical reflective practice  Personas as a method for reframing mind-sets and thereby creating a reflective practice
<b>PAPER 3</b> The Future Gap: exploring a critical reflective stakeholder approach	Future scenario workshop  Scenario creation  Workshop with interest groups	Scenarios  Future scenario workshop  Future Workshops	Principles of reframing understandings Guidelines for stimulating critical reflections  Future idealized scenarios as a method for reconstructing understanding
<b>PAPER 4</b> Gendered innovative design - critical reflections stimulated by personas	Context mapping Persona creation Switched gender persona creation Workshops with various interest groups	Personas  Switched gender personas  Workshops	Guidelines for reframing understandings and widening awareness of gender constructions  Switched gender personas as a method for stimulating a gender aware design

Figure 13. Summary of appended papers.

# PAPER 1

Wikberg Nilsson, Å. & Johansson, S. (2010) Reflection for action: a collaborative approach to the design of a future factory. In P. Vink et al. (Eds) *Advances in occupational, social and organisational ergonomics*, pp. 10-19. Boca Raton; Fla: CRC Press

## REFLECTION-FOR-ACTION: A COLLABORATIVE APPROACH TO THE DESIGN OF A FUTURE FACTORY

In *Paper 1*, the collaborative design research approach applied in the Future Factory project is explored. The aim of this paper was to give an outline of the whole project approach, as a fundamentally different approach to work and workplace design. The difference concerns collaborations of variant stakeholders, and the emphasis on human experiences. This paper was written with a focus on the field of Social Ergonomics. In this, inspiration was drawn from situated work practice as described by Suchman (1987; 1997). She coins the concept of 'situated action' as:

"The view that every course of action depends in essential ways upon its material and social circumstances" (Suchman, 1997 p. 50)

Suchman (1987) further describes that situated action concerns the correlation between context and action, that is, the one cannot be separated from the other. Moreover, in similar ways Bannon (1998) describes traditional ergonomics as more interested in human actors than human factors as a basis for technology and system development. His criticism concerns what he considers as the one-sided focus on productivity and efficiency, rather than on the people who are going to use the products or the systems, and their social context.

The reason for thinking differently about change and development of work and workplaces is in this paper stated as the dilemma for the industrial sector to attract young people and in particular women. As current work and workplace change and development in the industrial sector is said to involve few stakeholders (Bellgran & Säfsten, 2005), the ambition is described as thinking differently about those who are involved and who should be in the focus of the process.

In this paper the proposal is that an action-based design research approach with a multitude of stakeholders involved can be seen as a space for reflection both of current states and future possibilities. The methodology draws inspiration from reflections as described by Dewey (1998a) and Schön (1995). Additionally, this paper explores reflection-for-action, suggested by Ghaye (2007) as interventions that are initiated for a reason and which includes elements of reflection on practice to make a positive change. This is similar to Jungk and Müllert's (1989) arguments for social innovation undertaken in Future Workshops. The approach to Future Workshops is further described as involving a variety of stakeholders in reflections of what-is and what-ought-to-be (Simon, 1996).

The synergetic effect of a workshop is proposed to ideally involve each individual actor building on the understanding of the others', whereby the interaction contributes to knowledge production, as described by Latour (1996). The understanding of a workshop session as contributing to knowledge production is also described as an alternative approach to development of technology and production systems.

Likewise, Ullmark (1996) suggests a design approach to change and development of work and workplaces. The main reason is the difference in methodology, to address the whole production system rather than to focus on an identified problem that is divided into sub-problems handled separately. The risk with such an approach is that reasons for the stated problem are not identified and thereby the solution risks not working in its intended context. Likewise, in this paper the inspiration of Gestalt theory for the design of work and workplaces is further drawn from Henderson (2005), in the suggestion of addressing technology, user value, business value and strategic value as interrelated work system areas.

Probing change by performing design in is proposed as a method to challenge present work and workplace design. The guidelines for such an approach include encompassing multiple values by including a variety of stakeholders in the process, and to embrace gender-awareness in the design of work and workplaces.

I was the lead author of this paper and also focused on the design approach. My co-author was lead author for our second contribution to this book (Johansson & Wikberg Nilsson, 2010), concerning use of system theory for work and workplaces. In retrospect, I see all the fundamental principles described in this paper as equally important today.

# PAPER 2

Wikberg Nilsson, Å., Fältholm, Y & Abrahamsson, L. (2010)  
Reframing practice through the use of Personas. *International Journal of Reflective Practice*, Vol. 11, No. 3, pp. 285-298

## REFRAMING PRACTICE THROUGH THE USE OF PERSONAS

The aim of this paper was to explore the Persona method for stimulating critical reflections in collaborative stakeholder activities. The aim was to explore whether this method could contribute to a reframing of prevailing logic and be used as a tool for sharing various experiences and perceptions between participants in the Future Factory project.

The reasons for doing this are the background of a strong domination of men within Swedish industry sector (Statistics Sweden, 2010b), and the arguments of young people opting out of industrial work (Ziebertz & Kay, 2005; Lindgren et al., 2005). Therefore, the project idea is described as particularly embracing those stakeholders' needs and preferences.

The Persona development process is detailed in this paper, described as originating in context mapping through interviews and observations of the situation concerned. In the current case the focus was on women working in the industrial sector. As Argyris (1991) argues, a community of practice may have difficulty in escaping established ways of thinking or even of raising critical voices about what issues are to be addressed. Therefore, the context mapping concerned understanding and learning the context of the Swedish industry sector through interviews and observations.

The Persona development process described in this paper continued with contextualizing in the form of watching, listening, asking, learning the language, workplace culture, norms and perspectives. This material was subsequently analysed in the search for patterns that could be the basis for a Persona character. The development of Personas therefore differs from focusing on a target group of users who are currently using a product. Instead, in this paper we describe the process as involving a wide perspective of both present and prospective stakeholders.

The context mapping provided three Personas used in the Future Factory project. Persona Anna describes a young woman working at an assembly line. The work is heavy and stressful, and

the work equipment, tools and work wear are not adapted to her physique and capabilities. The rationale for Anna is described as both dealing with some gender issues and the previously described issue of young people opting out of industrial work. The second Persona, Eva, is described as a middle-aged woman working with assembly. A recent workplace re-organisation resulted in a return to the previously stable state, as the work force dominated by men did not want to undertake what was described as “womens’ work”. Therefore, the rationale for Eva is said to concern gender issues of segregated workplace cultures and change processes not resulting in imbalance of the stable state. Persona Dan is the third Persona portrayed in this paper. The rationale for him concerns the industrial sector outsourcing work tasks. Internal personnel therefore risk losing their jobs. Consequently, the external work force is often considered as a threat. Likewise, the work situation for external personnel is often referred to as stressful and hard, and the search for minimizing costs can affect safety at work. These were issues found in the preliminary context mapping, and which we decided to further address with the project participants.

The Personas were subsequently used in various workshop activities and therein validated as credible characters. The project actors’ reflections concerned the Persona issues and their future imaginations dealt with visions of making a positive change. In this paper, the argument is hence that the approach of using Personas, emphasizing some experienced situations and realities, contributed to participants’ critical reflections over the situations that the Personas addressed. The conclusion of this paper is that the method is a new and innovative method for work and workplace design, in communicating research findings, as well as supporting a reframing of mind-sets. Therefore, in this paper we recognize it as an important tool for development of a critical practice that also concerns future imaginations of how things could ideally be.

In this paper, I served as the lead author and performed the interviews and observations upon which the Personas are based. The co-authors *Ylva Fältholm* and *Lena Abrahamsson* participated in the workshops where the Personas were implemented, and therein conducted participant observations. The workshops were additionally video recorded in order to study interactions during the activities and to be able to draw quotations from the material.

# PAPER 3

Wikberg Nilsson, Å. & Fältholm, Y. (2011) The Future Gap - exploring a critical reflective stakeholder approach. *Journal of Management and Sustainability, Vol. 1, No. 1, pp. 18-31, September 2011*

## **THE FUTURE GAP - EXPLORING A CRITICAL REFLECTIVE STAKEHOLDER APPROACH**

The focus of this paper is on one of the first activities in the Future Factory project, that is, the Future Scenario workshop with young people. The reason for inviting young people to the project activities in this work is to achieve a better understanding of various experiences and perceptions behind the argument for young people opting out of industrial work (Ziebertz & Kay, 2005; Lindgren et al., 2005). Thereby, the aim of this paper is to explore some young people's needs and perceptions of future work and workplaces.

One argument that often is put forward as a factor for wanting a job is high wages. However, despite the fairly high wages in the industrial sector, young people seem not to be interested. Instead, young people in Sweden are said to value other factors, such as social networks and activities that provide authenticity and satisfaction (Ziebertz & Kay, 2005; Lindgren et al., 2005). In addition, there is an argument that young people are not being attracted to the industry sector because of a perception of it as having an instrumental focus on standardization and discipline (Gillberg, 2010).

In this paper, the argument is that young people as a group should be seen as a stakeholder group, since they are prospective employees, customers or investors, or simply part of a wider society with which the companies should interact for democratic reasons. We further explore the future gap, meaning internal stakeholders such as employers and employees having one understanding of their company, activities, and products, while external stakeholders may have another understanding of the same.

The approach in this activity was inspired by the Future Scenario Workshop methodology (Drewes Nielsen, 2006), involving a group of 23 young people (aged 17 to 18 years) in discussing what constitutes a good work and work place. Primarily, the aim of the workshop was for the young people to develop future scenarios of their 'ideal' work setting, including discussions and

ideas of what their work tasks could be, how they would interact with colleagues, what the work environment might look like and how it could function.

With inspiration drawn from Rehal and Birgersson (2006), in the future scenario workshop I applied 'associative images' as objects to think with (Schön, 1983). The use of images is proposed in this paper as a tool that initiates reflection. Furthermore, the Idealized Future Scenario approach is described in this paper. The search for overall patterns in the young people's scenarios resulted in the development of the optimistic future vision of Utopia, and the pessimistic future concerns and fears summarized in the Dystopia scenario.

Those scenarios were subsequently used to instigate a reconstruction of prevailing logic. That is, other project actors were presented to these scenarios. Like in Schön (1983), the scenarios can be seen as a restructuring of the current situation in order to provide new insights through the restaging of a situation. Therefore, the scenarios can be seen as tools that stimulate thinking innovatively. I consider this to involve both the reflection made when developing a scenario, and the reflection that is made in the exploration of the scenario.

For this reason, the conclusion of this paper is a proposal of a multi-stakeholder scenario-based design approach involving exploration of both the present and the future by Idealized Future Scenarios. In this paper the argument is also that inviting young people as an interest group may benefit companies, which will have the possibility of being proactive and acquiring ideas and inspiration for development. Moreover, there are benefits in a multi-stakeholder approach for young people, since they are given the opportunity of taking part in society and community development and being stimulated in thinking about their own future.

In this paper, I served as lead author and also as sole facilitator of the workshop itself. However, *Ylva Fältholm* was part of the initial discussions of the approach, and also contributed to the analysis of the young people's scenarios.

# PAPER 4

Källhammer, E. & Wikberg Nilsson, Å. (forthcoming 2012)  
Gendered innovative design – critical reflections stimulated by  
Personas. In E. Gunnarsson, E. Sundin, K. Berglund & S.  
Andersson's (Eds) *Gendering Innovations*. Stockholm: Vinnova

## **GENDERED INNOVATIVE DESIGN - CRITICAL REFLECTIONS STIMULATED BY PERSONAS**

In this paper, the focus is on the re-thinking of the Persona method into a tool for a critical reflection in gender interventions. The action-based approach used in both the Future Factory and the Daring Gender<sup>21</sup> project is explored.

The proposal is for a merger between design practice and gender theory, to realize the normative character of design that contributes to stereotypical assumptions of women and men, and to move the field of gender beyond 'armchair feminism' into taking action for how-it-ought-to-be (Simon, 1996).

The argument here is that people in general need something that assists and stimulates reflection. Dealing with gender issues is portrayed as dealing with complex situations that are difficult to discuss and approach verbally. For this reason, we propose the Persona method to be used, since it seems to consign the "difficult women's issue" into characterizations that seems to be easier both to discuss and to emphasise with.

The Persona development process is described as based on context mapping, pattern finding, Persona characterization, Scenario development, and validation of the Persona character in interaction with various actors. This empirical base is also often described as the basis for traditional Persona development (e.g. Cooper, 1999; Grudin & Pruitt, 2002; 2003; Pruitt & Adlin, 2006; Nielsen, 2004). However, we additionally explore our rethinking of this design method by reversed gender of the Personas to illustrate how stereotypical assumptions of women and men are inscribed in products, systems, structures, interactions, symbols, and individual identities.

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<sup>21</sup> 'Daring Gender', a LTU research project concerning with academic entrepreneurship and innovation. The aim of this project is to create gender awareness and contribute to equal and innovative environments. I have been part of this project by developing the Persona method and by performing some initial interviews.

Our experiences of implementing the Switched Gender Personas method are further described in this paper. The conclusion is that the redesign of the Persona method seems to engage people in dialogues about gender, people who are not at all familiar with gender theories. The Persona method also contributes to a challenge of 'bounded technical rationality' (Schön, 1983), as it involves an emphasis on human experiences and perceptions. Consequently, the Switched Gender Persona method illustrates a useful tool to reconstruct awareness of gender.

The gendered Personas are in this paper explored through the academic entrepreneurship project 'Daring Gender' *Persona Sven*, described as a thirty-nine year old associate professor within an engineering faculty. He is portrayed as a hard working academic entrepreneur who has issues with an inflexible academic system that does not recognize his efforts to make a contribution to society. Sven is described as working in a research team that is all male except for one woman, and he has a wife that takes care of the children and does all the household duties. This Persona characterization is based on empirical research materials. So far, in our experience the Persona contributes to a discussion on various experiences of the work practice within the specific context.

Thereafter, the gender of Persona Sven is reversed. Hence, the scenario instead presents *Persona Sara*. Although the story is the same, the gender is different. This contributes to illustrate consequences of being a woman in the specific work context. For example, Persona Sara becomes a token, instead of sharing Sven's situation of being a member of a dominant group. Additionally, innovation and entrepreneurship are areas that are symbolically associated with men (Ahl, 2004; 2006), which contribute to discussions of different opportunities for women and men. Persona Sara's family situation of having a husband working part-time who takes care of the children and does all the household duties, is in our experience the first aspect that participants recognizes as unusual. Thereafter, other aspects as well contribute to a serious reconsideration of gender among the project actors. The conclusion is that the interactive research approach by means of the Switched Gender Persona method contributes to talk beyond that of the "problematic women issue" and shows a way not only to illustrate and discuss gender inequality, but also to actually challenge it, and, in the long run, be a way to unsettle conventional beliefs regarding gender.

In this paper, the co-author *Eva Källhammer* and I have jointly discussed, redeveloped the method, and collaboratively written the

paper. The empirical material, which the paper is based upon, comes from both the Future Factory and the Daring Gender projects. I have participated in both projects, although only to a small extent in the latter. In the early stages of the Daring Gender project, I interviewed students about innovation and entrepreneurship, and also introduced the Persona method to this project's team members. Eva has done all the remaining interviews within this project. This paper is hence based on our interdisciplinary approach, as we have learned from, and been inspired by, each other's disciplines during this work.

## RELATED PUBLICATIONS

In addition to the previously outlined appended papers, the following papers are related publications, which I have taken a considerable part in. Although, those are not appended to this thesis:

- Johansson, S., Wikberg Nilsson, Å., Abrahamsson, L. & Fältholm, Y. (2009) Effective Use of Human Actors in Change Processes – a participative approach to industrial development. *In Proceedings of SPS 09, December 2009, Gothenburg, Sweden*
- Johansson, S. & Wikberg Nilsson, Å. (2010) A Challenge for the Future: efficient, attractive and sustainable factories. In P. Vink & J. Kantola's (eds) *Advances in Occupational, Social, and Organisational Ergonomics*, pp. 548-558. Boca Raton, Fla: CRC Press LLC
- Källhammer, E. & Wikberg Nilsson, Å. (2010) Personas as a method for applied gender research. *Paper presented at GWO 2010, Gender, Work and Organisation, June 2010, Keele University, UK*
- Källhammer, E. & Wikberg Nilsson, Å. (2011) Innovation: change initiated by a design and gender approach. *In Proceedings of the 4<sup>th</sup> ISPIIM Innovation Symposium 2011, November 29<sup>th</sup> – December 2<sup>nd</sup>, Wellington, New Zealand*
- Källhammer, E. & Wikberg Nilsson, Å. (2011) Personas: en interaktiv metod för ökad genusmedvetenhet i arbetslivet. (In Swedish). *Paper presented at FALF 2011 'Det nya arbetslivet', June 2011, Luleå, Sweden*

- Wikberg Nilsson, Å., Fältholm, Y. & Abrahamsson, L. (2009) The Future Factory – a concept developed by women and young people. *In Proceedings of IEA 09, August 2009, Beijing, China*
- Wikberg Nilsson, Å. & Källhammer, E. (2010) Personas as a method for applying gender theory within two Triple Helix constellations. *Paper presented at the 8<sup>th</sup> Triple Helix Conference, October 2010, Madrid, Spain*
- Wikberg Nilsson, Å., Abrahamsson, L., Fältholm, Y., Johansson, B., Johansson, J., Johansson, S. & Rask, K. (2011) *Framtidsfabriken - en vision av framtidens effektiva och attraktiva arbetsmiljöer i industrin*. (In Swedish). Research report. Luleå: Department of Human Work Science, Luleå University of Technology



# 6 RESULTS

As the overall objective of this thesis is the exploration of a design lab approach as a means to initiate thinking of experiences and alternative solutions in work and workplace design, this final chapter of the thesis contains the results achieved. Moreover, as the research work was undertaken as a *probing* of change by design, the results are described both in terms of lessons learned and knowledge gained, with the support of participants' reflections as well as my own. Some of the previously mentioned research material in the form of quotations, images, workshop outcomes, Personas, and Scenarios are hence used in this section to illustrate the results. It would take up too much space to give an accurate account of all material. However, in the following text I discuss and reflect on the results with help of parts of this material.

Firstly, I discuss the results of the first inspiration and preparation phase of exploring experiences and meaning. This was done through context mapping in interviews and observations. Thereafter I describe the results of the re-thinking of the Personas method, the development of the method, and some reflections of the Persona approach. The use of Idealized Future Scenarios method in the current research is additionally discussed as a result, and the Utopia and Dystopia scenarios are presented. The results of the collaborative activities are described as Design space explorations. The results of working with visions, with participants, and a gender-aware design are also described in those sections. The Guidelines that was developed for a future factory and for implementing a 'design lab' approach are presented in the following sections. Finally, I reflect on the actions taken and discuss design labs as arenas for change, and the current research contributions.



# 6.1 EXPERIENCES AND MEANINGS

In this section I present the results of the first phase of exploring various experiences and meanings through context mapping. Although not part of the collaborative work, this preparation and inspirational phase was important, since it gave both understanding and material to the upcoming activities.

In this initial problem setting, my ambition was to understand issues, needs, values, and preferences held by the people working within this context. In the current research study, there was however not one particular context, but a whole industrial sector, including a diversity of experiences and perceptions. As the Future Factory project included a particular emphasis on women's and young people's needs and preferences, this was considered as the main focus of the first phase.

A general response to that there are few women in the industrial sector, and that young people are opting out of it, often seems to be expressed in terms of changing women's and young people's attitudes. In contrast, the idea with a design lab approach included exploring various experiences, and use that as input to rethink the industrial sector in an alternative future scenario.

## CONTEXT MAPPING

In the initiation of this work, statistics provided some facts and figures on the structure of the Swedish industry sector, for example the previously mentioned statistics of 16.5 per cent of those working in the manufacturing sector are women (Statistics Sweden, 2010a; 2010b). However, to understand various experiences of working in the industrial sector, and to understand different meanings that some women attribute to industrial work, required a broader understanding, than facts and figures can provide. Hence, I decided to use qualitative context mapping through interviews and observations.

The interview respondents obviously had different experiences: They were working in different companies, with different work tasks, and so forth. I want to stress this however, as it otherwise can be interpreted as if all women working in the industrial sector have similar experiences. This is not the case, although there were some experiences of being in the minority that I consider important to share with others.

For example, one of the respondents expressed that a good experience is that women are being placed with each other. Although, as she stressed, not by segregating women into doing specific “womens’ work tasks”. Instead, by having at least two women in each work team, and preferably with a woman supervisor or mentor.

When questioned about the implications of being a woman working in the industrial sector, most respondents gave answers that dealt with not having women’s work wear, and not having equipment and tools that were adjusted to women’s physique. An effect of this, besides not being able to do the job properly, is described in the following quotation:

“The major limitation for women, I would say, is that the tools and equipment are not adapted to women. It was really frustrating when I first started because I could not perform all the work stages. They have some stepladders, but how smart is this when the line is moving forward? Some tools are really heavy as well. You have to be really strong to pull down the tools. It is just so frustrating when you cannot participate fully, and then you also automatically get excluded from the work team. They want someone who is able to do all the tasks, of course. There are some areas where the staffs have been the same for many years. Those areas have no women. So it is tough.” (Quotation from interview 2008)

This expression illustrates a significant experience. The feeling of being different is an aspect that fundamentally demolishes a good group climate (Lewin, 1947; 1951), and hence an aspect that can contribute to high staff turnover. Whereas statements about tools and equipment being too heavy are often used as arguments for women not being ‘made’ for industrial work, it can in contrast be seen as an argument for a re-design of tools and equipment based on a diversity of skills and bodies. If tools and equipment are too heavy for some women, it is likely that they are too heavy for some men as well.

## **SYMBOLIC INDUSTRIAL WORKER IDENTITY**

To further exemplify the consequences of being one of few women working in the industrial sector, one of the respondents said that she was quite used to being selected based solely on the basis of being a woman. Thus, her experience was that she was being selected for photographing and other activities in which the company, according to her, wants to “...*validate that actually women*

*are working here*” (quotation from interview 2008). Such experiences are also significant, because they illustrate how the fact of being a woman is re-constructed as being different from the symbolic identity of an industrial worker.

Kanter (1977; 1993) refers to the minority issue as ‘tokenism’, meaning that being in the minority results in attracting more attention, as more often being seen as representative for the whole category of women. In addition, it more often involves being perceived based on stereotypical assumptions of women. Therefore, according to this view it seems as men are judged based on the skills and knowledge they have, and as women are judged based on their gender. Furthermore, as the skills and knowledge of the ‘token’ are not always recognized, most women in minority positions feel that they have to work twice as hard to prove themselves worthy.

However, there is a paradox in the minority aspect. If there is interest in having more women in the recruitment base, there is a need to transform the symbolism associated with industrial work and workplaces. This requires communication by several means the fact that women already are in the industrial sector and hence are able to do the job. At the same time, this person’s experience of work colleagues’ mocking words whenever she was asked to be a company representative, consequently, illustrates a negative experience of being different. This is the paradox: To have more women realizing that industrial work is an alternative for them requires that the women working in the sector contribute with their experiences, which can in turn contribute to a feeling of being different.

One of the respondents mentioned that all of her male work colleagues knew that she was as good as them, or even better (her statement) at doing the job. Despite this, when she applied for further training, and the work team made a collective decision on who to vote for, she was turned down based on that fact that no woman had done that job before. This experience is illustrated in the following quotation:

“I have thought a lot about this, why didn’t they want me for that job, when they knew I could do it? I think they felt challenged by a woman being able to do the same thing they do. I am so naïve, thinking they would consider it good to get a person committed to do a good job! [Laugh]” (Quotation from interview 2008)

This is a gender issue, since it was not her capabilities as a work team member that made the work team turn her application down, but the aspect of her being a woman. This illustrates Kanter’s

(1993) argument of women and men being judged on different terms. However, this respondents experience provided me with a deeper understanding of the need to address 'Doing Gender' (West & Zimmerman, 1987; Acker, 1999), in order for more women to consider the industrial sector.

Despite the fairly negative experience expressed by this respondent, most of the interview respondents really enjoyed their work and did not want to trade it for working in, for example, the healthcare sector. Several expressed that they are always referred to as 'tomboys'<sup>22</sup>, as they explained that they did not like to do "women's stuff". This fact is interesting as it illustrates the identity those persons have constructed for being in the minority. They do not want to be associated with "other women", but are at the same time not fully accepted in the work teams.

This is a dilemma. If there is interest in recruiting more women, and as diversity is an acknowledged aspect of productive and innovative work teams (Kanter, 1988), there should be more interest in communicating various industrial worker identities, both internally and externally. Hence, not making people feel they have to adapt a certain symbolic (male) industrial worker identity.

## WORKPLACE DESIGN

Another observation in the preliminary phase was that there seems to be little effort in considerate design of industrial workplaces. It seems as if the general idea is, what was expressed as the workplace being "*...just places for dirty work*", often also referred to as only functional, which was used as argument for "*...no need for decorations*" (quotations from observation 2008).

At one of the sites, one man told me that they once had a woman working there. According to him, she wanted to "*...put candlesticks in the windows at Christmas, and wanted curtains in the lunchroom*". They didn't need that, as they, again according to him, "*...just eat and drink coffee in there*". But, "*...she was good, as she could do the dishes*" (quotations from observation, 2008). This can be likened with Kanter's (1993) discussion on the dominant groups referring to 'tokens' in terms of stereotypical assumptions. Thus, according to such stereotypical assumptions, every woman just wants decorations, which also illustrates the assumption that decoration has nothing to do with function. Whereas more emphasis placed on

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<sup>22</sup> Tomboy: according to the Merriam-Webster dictionary a girl who enjoys things people generally think are more suited to boys ([www.merriam-webster.com](http://www.merriam-webster.com) 2012-01-12)

the workplace would possibly contribute to a better-experienced work environment for all, a consequence can be that new employees are socialized into referring to the workplace with similar jargons.

Moreover, as Ehrnberger (2007) argues that aesthetic features can contribute to an experienced improved performance, I wished to explore from the project participants whether more emphasis on the design of the work environment could contribute to improving the perceived functionality. This can also be likened with Norman's (1999) concept of affordance, meaning a perceived increase in performance provided by the aesthetic appearance. With more emphasis on aesthetic appearance, I do not mean an occasional flower or curtain, but rather a design of the whole workplace that supports both functionality and symbolism. This could possibly contribute to a more effective and attractive workplace for all.

The interviews and observations provided a rich base of various experiences and inspirations that I think illustrate a need for a re-design of industrial work and workplaces.

## 6.2 RETHINKING PERSONAS

As the idea of the current research was *change by design*, I naturally took inspiration from some established design methods. The focus of this section is hence the results of the refining and rethinking of the Persona method applied in the Future Factory project. The emphasis on developing principles and methods to engender understanding of various experiences resulted in the use of Personas for exploring various meanings, and for reframing or reconstructing understandings. This is further described in the following section.

### APPROACH TO THE PERSONA METHOD

The Persona method is a frequently applied design tool, usually with the objective of focusing the design work on a group of users in product, service and systems design. The reason for using the Persona method in the Future Factory project was similar to Cooper's (1999) argument that the Persona is a fictional description of a person who is relevant to the project it is designed for. In the Future Factory project, I developed the three Personas; Eva, Anna and Dan based on some of the aspects identified during the initial phases. Those Personas were implemented throughout the study, with various interest groups and with continuously updated information. The inspiration for the Persona development came from various descriptions. For example, Cooper (1999) coined the term Personas. However, his Persona development is described in terms of developing stereotypes that the product development team can recognize and relate to. This did not seem appropriate for a project in which one foundation was, for example, to include for women's needs and preferences. Instead, I took inspiration from descriptions of Persona development as described by Grudin and Pruitt (2002; 2003), Pruitt and Adlin (2006), and Nielsen (2004) and developed an approach to the method, as is illustrated in Figure 14.

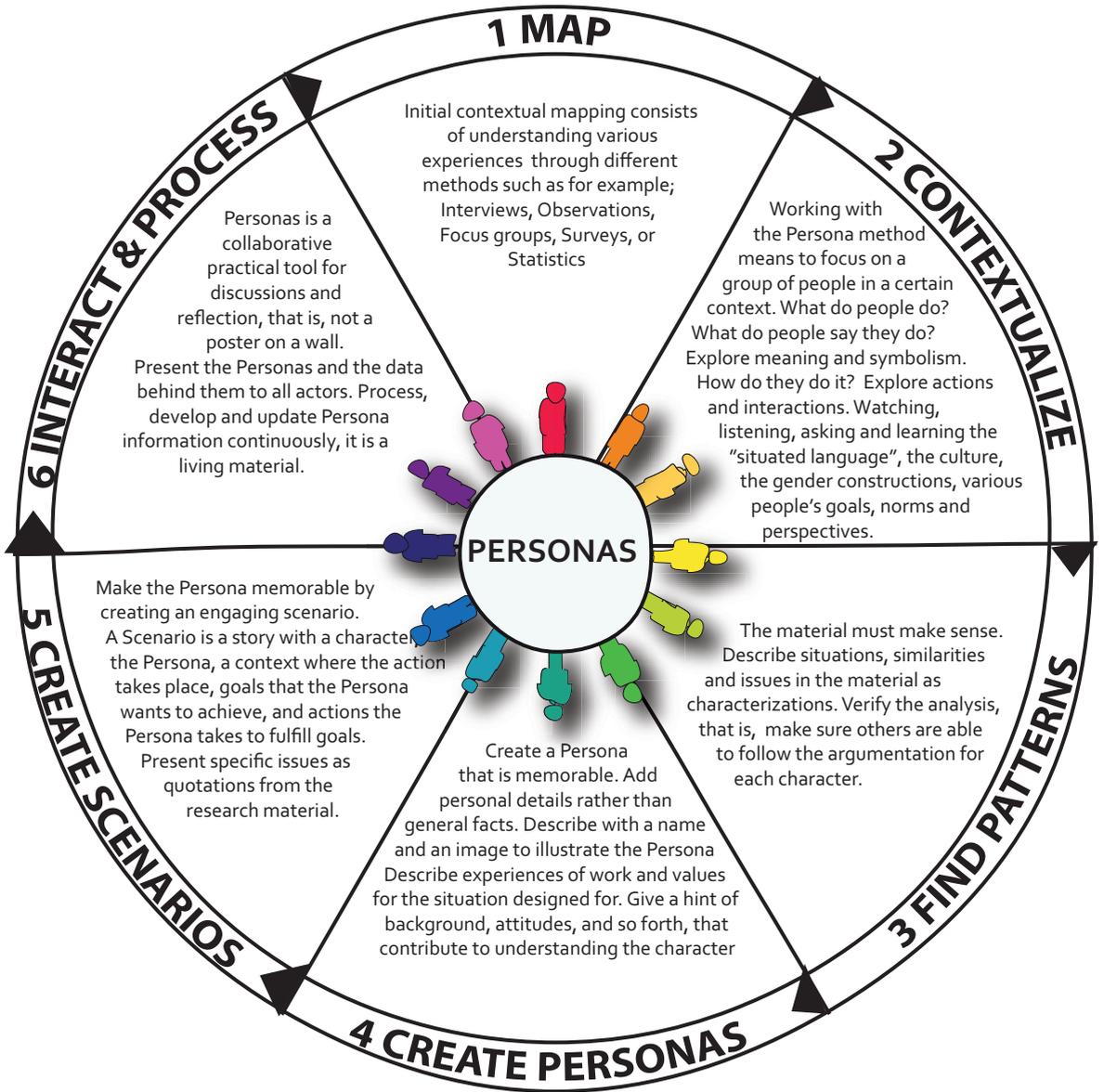


Figure 14. Illustration of the Persona development process in the current research.

## RESULTS OF USING THE PERSONA METHOD

The introduction of the three Personas in the various collaborations with interest groups initially seemed to nurture critical reflections about existing industrial contexts.

For example, in the case of the Persona Anna, the criticism was of the re-introduction of assembly lines, when, as was stated, *"...we have just managed to get rid of them"* (quotation from workshop 2008). The experience as woman being in the minority, was emphasised as important, although several actors concluded that the behaviour 'she' had experienced resulted from what was referred to as *"...a dying breed of men"* (quotation from workshop 2008) and was therefore seen as something that will disappear.

Persona Dan's scenario portrays a different situation, since 'he' works in an industrial context, but is employed by an outside firm. Some of the discussions concerned 'his' experiences of being an outsider, exemplified by stories of some of the participant's own experiences of similar situations. Thus, several actors seemed to embrace Persona Dan and read more into the scenario than was actually in the written text, based on their own experiences. Besides the critical stance, the positive aspects of Dan's situation were discussed as benefits of seeing a variety of workplaces, thereby, an increased understanding of various ways of doing things. This, several actors thought of as a good idea for stimulating thinking innovatively in workplace developments and change.

Based on Persona Lena's scenario, actors for example discussed the challenge of forcing work rotation to decrease occupational injuries. The main point in this was that workplaces ought to be designed to prevent ill health, instead of *"...considering people as interchangeable machines"* (quotation from workshop 2008). In addition, corporate social responsibility was discussed to involve taking care of people who suffer from work-related ill health. According to some of the project actors, *"...employers do not have knowledge on how to create good work and workplaces"* (quotation from workshop 2008), and therefore employees ought to be participating to a larger extent in decisions and planning.

The project participants' experiences of the Persona method varied. Some said that the Personas portrayed situations that they were all too familiar with and therefore did not add anything new, and others considered it a good method to portray various experiences. Some said that the Personas made the discussions focus too much on 'soft issues'. My own reflection is that the

Persona scenarios are taken from real contexts and therefore do not present anything 'new'. On the contrary, the project actors' reflections of already being aware of the situations, I consider to be a validation of the research material. The idea was instead to stimulate thinking of experiences as base for work and workplace design. This can explain why some considered there to be an over-emphasis on 'soft issues'. Although most participants considered such aspects as important, some participants discussed a neglect of such aspects, as the correlation with efficiency and productivity is not generally recognized.

## **NEW THINKING BY PERSONAS**

In respect of thinking innovatively, the main contribution with the Personas was the support to actors' reflections of alternative ways of doing and experiences things. Like Brandt (2006), I consider Personas developed by people outside the design team as not providing the necessary commitment and understanding.

This was an issue in the Future Factory project as well, as I sometimes had to support the Persona scenarios to other project actors. I knew the background, and could describe the situations that were communicated through the Persona scenarios. To have the background information, and to be able to explain the situations, were very valuable, and something that I considered contributing to the Personas' credibility. Therefore, in this project it was crucial to understand the research material.

The use of the Personas in this project was similar to what Bowker and Star (1999) describe as 'boundary objects'. The use of the Persona method can hence be seen as a collaborative design material that the participants can discuss and "interact with" during the process in order to reframe their awareness of a user and usage situation. Thereby, underlying issues and new opportunities can emerge and contribute to a meaningful solution.

Equally, as Johansson and Messeter (2005) stress, this is not a way of excluding 'real' users from a development process, but rather a way of including a variety of ontological differences and having them as representations during the process. This was obvious in the Future Factory project, expressed in one of the participant's reflections;

"Take this with Personas for example, it may result in a project going in wrong directions, not wrong exactly, but it leads into this type of more Personal and softer issues. I think that the Personas hence control the purpose" (Quotation from follow-up interview 2011)

In this quotation, this project actor expresses concern over the project focus moving towards more personal and softer issues. The observation of Personas controlling the purpose is of course an implication of the method that is important to note. The experimental approach in the Future Factory project concerned probing a design approach of including various experiences in work and workplace design.

A result is therefore that this Persona approach did contribute to encourage the participants to explore experiences. Hence, this approach did contribute to a more reflective design process. It seems, however, that the actors engaging in Persona experiences meant that some actors thought that other aspects were forgotten or overlooked in the process.

## **REDESIGN OF THE PERSONA METHOD**

An issue when applying the method in the Future Factory project was the risk of creating stereotypes. For example, Cooper (1999) observes that team members are more likely to engage in established clichés, rather than with those that violate stereotypical assumptions of actors. This is exemplified as teenage computer-users should be nerds, nurses should be women etc. In a project with an objective of challenging such stable state orders, this was of course problematic.

In contrast to Cooper, the current research idea was to challenge or even provoke stereotypical assumptions, yet describe some experiences from people working in the industrial context. When experiences consist of certain work tasks being too heavy and stressful for some women, there is a risk of establishing women as weak, instead of challenging work equipment and tools as being designed based only on men's physique. Consequently, gender is not the issue. Rather the issue is the work equipment. But it becomes a gender issue if it is presented as work tasks being too heavy for women.

The Personas can contribute to spread an understanding of a diversification of masculinities and femininities, as the scenarios address various experiences of being a woman and a man in a certain context. But the problematic issue with the method remains in the resulting Persona in itself. As the Personas are characterized as either women or men, there was a risk of reproducing dichotomies between women and men.

In the project team we, for example, discussed presenting them as neither women nor men. However, such Personas risked not being credible and engaging characters. In collaboration with a research colleague I experimented with reversing the gender of the Personas. This was a useful method for widening awareness of gender issues as it illustrated some of the presumptions held about women and men.

It does, however, also illustrate that this is not as simple as a statement of being affirmative of gender equality. It takes even more profound actions to break established stable states. Reversing the gender of the Personas however demonstrated one way to reframe mind-sets and to initiate thinking innovatively. This is therefore an important research result. Persona Anna's and Persona Anders' scenarios in the following sections illustrate this.



Photo 4. Illustrating Persona Anna. Photo: Anders Berglund

## “Anna”

This is Anna, a 27-year-old woman working in the Swedish industry sector. She works at an assembly line in a team of 13 people. All are men apart from her. Anna thinks this is okay as she claims to have always been somewhat of a ‘tomboy’ as she also grew up with three older brothers. For example she learned to repair motorbikes before she started school.

At the production line, each work operation is time-constrained, in the allotted time Anna and her team are supposed to perform the tasks her station is assigned to. If she, or someone else, does something wrong or does not finish in time, a bell signals and the line stops. This happened to a woman working at the plant before Anna. They are still talking about “women not being fit for the job”.

The mistake of one woman symbolizes all women’s mistakes. Thus Anna is determined to do well, although her being short causes her some trouble. There is also the problem with clothing.

Her male sized work wear does not fit very well even though Anna is small and there is no female work wear. She folds up the trouser legs and sleeves on her S size men’s work wear, but it is difficult to work effectively as the clothes do not fit her. Anna has worked at the company for 1.5 years, and she is really determined to do a good job. The job is quite simple. “*It is not like it is rocket science*”, says Anna, “one learns the tasks in just a few weeks”. Anna’s manager has noted her efforts and would like Anna to get further training and thus new work tasks. However, at this company it is the members of the work team who decide who will get the training, and they have turned down Anna’s application, based on the argument that no woman has done that job before.

*“I have thought a lot about this, why didn’t they want me for that job, when they knew I could do it? I think they felt challenged by a woman being able to do the same thing as they do. I am so naïve, thinking they would consider it good to get a person committed to doing a good job! [Laugh]”*

This incident has left Anna a bit puzzled. Why didn’t her team members suggest her for the job, and does this mean she will she stay at the factory or not? Her manager is good though, for example, he always makes sure Anna is included when there are company presentations, that is photo shoots and such things, though this is not very popular among her colleagues. “*I just want to do a good job and get some appreciation for that, that’s all!*” says Anna.



Photo 5. Illustrating Persona Anders. Photo: Anders Berglund

## “Anders”

This is Anders, a 27-year-old man working in the Swedish industry sector. He works at an assembly line in a team of 13 people. All are women apart from him. Anders thinks this is okay as he claims to have always been somewhat of a ‘sissy’ as he also grew up with three older sisters. For example he learned to handle a sewing machine before he started school. At the production line, each work operation is time-constrained, in the allotted time Anders and his team are supposed to perform the tasks his station is assigned to. If he, or someone else, does something wrong or does not finish in time, a bell signals and the line stops. This happened to a man working at the plant before Anders. They are still talking about “*men not being fit for the job*”

The mistake of one man symbolizes all men’s mistakes, thus Anders is determined to do well, although his being short causes him some trouble. There is also the problem with clothing.

His female sized work wear does not fit very well even though Anders is small and there is no male work wear. He folds up the trouser legs and sleeves on his XL size women’s work wear, but it is difficult to work effectively as the clothes do not fit him.

Anders has worked at the company for 1.5 years, and he is really determined to do a good job. The job is quite simple, “*it is not like it is rocket science*”, says Anders, “*one learns the tasks in just a few weeks*”.

Anders’s manager has noted his efforts and would like Anders to get further training and thus new work tasks. However, at this company it is the members of the work team who decide who will get the training, and they have turned down Anders’s application, based on the argument that no man has done that job before.

*“I have thought a lot about this, why didn’t they want me for that job, when they knew I could do it? I think they felt challenged by a man being able to do the same thing they do. I am so naïve, thinking they would consider it good to get a person committed to doing a good job! [Laugh]”*

This incident has left Anders a bit puzzled, why didn’t his team members suggest him for the job, and does this mean he will stay at the factory or not? His manager is good though, for example, she always makes sure Anders is included when there are company presentations, that is, photograph shoots and such things, though this is not very popular among his colleagues. “*I just want to do a good job and get some appreciation for that, that’s all!*” says Anders.

## REFLECTIONS ON USING PERSONAS

The scenarios of Persona Anna and Anders include some reversed stereotypical representations, such as Anna expressed as a woman 'tomboy' repairing motorbikes, and Anders expressed as a 'sissy'<sup>23</sup> handling the sewing machine. The interesting aspect of this is the intention of using the switched gender scenarios to challenge or to provoke a reconstruction of understandings, and hence possibly a contribution to an expanded awareness of alternative understandings.

This could be likened to Lewin's (1947) unfreezing stage involving what he refers to as emotional stir-ups. It is also similar to Dewey's (1998a) discussion of bringing to attention previously unreflected habits and non-scrutinized behaviour. Likewise, de Bono (1968) argues for some communities being closed and in need of fresh points of view. I am not sure that everybody agrees that the switched gender Personas are a *fresh* point of view, but as de Bono himself states: "...New Think has to do with breaking out of the old, self perpetuating patterns and generating new ways of looking at things" (1968 p.1). The switched gender Persona method can perhaps be referred to as a *new* way to stimulate considerations of various user situations, which fact perhaps can be agreed upon.

The representation of stereotypical behaviour does however necessitate a serious discussion of various consequences involved. Rehn describes creativity as not being a result of using games and talks, but by forcing the brain to do things that are different, awkward and heavy (2010 p. 30). This can be one motive for implementing the Switched Gender Persona method, to challenge and provoke gender constructions and discuss various alternatives.

Challenging prevailing logic can hence be seen as a contribution to thinking innovatively. In my view, this does not necessarily have to relate to gender issues. Gender constructions, one of the most stable institutions, can be used to challenge other prevailing logic, and possibly be a contribution to the development of new thought patterns. The major result, as I see it, hence is the contribution to making people think differently about what has previously been seen as a 'fact' or 'reality', hence, initiating new thought patterns.

The obvious difference between the application of the Persona method in the current study and its more traditional usage in design

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<sup>23</sup> Sissy: according to the Merriam-Webster dictionary a boy who enjoys things that people generally consider that girls like ([www.merriam-webster.com](http://www.merriam-webster.com) 2012-01-12)

practice is the objective of probing change rather than developing artefacts for a specific context. The relevance of using Personas in this project was to probe and to illustrate the possibility of a basis of a variety of experiences in the work and workplace design.

As I see it, an implication of implementing the Persona method, whether as data based or reversed characters, is that it can be thought of as 'true' representations of how-it-is. Therefore, an implication is the possibility of contributing to stereotypical assumptions about, for example, women and men. This implies the Persona method used in session in which various misinterpretations can be discovered and discussed.

A Persona creation includes interpretations of user needs and desires. An implication can also be misinterpretations based on 'ontological drifts' of meaning (Robinson & Bannon, 1991). Therefore, to validate the Persona characters by discussing them with various stakeholders in joint sessions, can be a way to avoid misunderstandings and spread different understandings and perspectives. This can also contribute to better work and workplace designs, as ontological drifts of meaning are circumvented by the inclusion and explorations of various stakeholder's experiences and meanings.

## 6.3 IDEALIZED FUTURE SCENARIOS

In this section the results of the applied approach to the Future Scenario method in the research are in focus. Like the previous method of Personas, the Scenario approach is an established and well-known tool for future simulations (Carroll, 2000). As the Scenario approach in the current project started in the workshop with young people, and continued with a development of Idealized Future Scenarios, it was a rather different approach to developing scenarios, and therefore a result of my research.

### RESULTS FROM THE FUTURE SCENARIO WORKSHOP

The future scenario workshop was an activity that aimed at understanding some young people's attitudes and perceptions of work and workplaces.

The perceptions of the industrial sector that the young people expressed during the workshop and in the scenarios certainly varied. In my view, young people cannot be seen as a homogenous group with one common attitude or one shared value. Instead, the ambition was to understand various perceptions among this group of young people. Although they were not altogether clear about their future occupations, most of them did not include work in the industrial sector in that picture. This opinion can obviously change, as realities of life makes it necessary to do things never considered during adolescence. However, a relevant question is whether this opinion is what industrial work should be considered as, the last resort for the ones who have nowhere else to go?

Those young people who most clearly expressed that they could not imagine working in the industrial sector in the future instead chose to describe their future scenarios of work tasks, environments and colleagues, as if it were in an industrial context. That is to say, the intention was reframed as to think differently about what working in industry could be in the future. For example, some described being a kindergarten teacher in the future factory, taking care of the employee's children. Some others described doing creative designs in the future factory, in close collaboration with production personnel.

There were also descriptions of more traditional industrial work, though expressed as having other values besides the work tasks. This is exemplified in the following quotation “...*I am doing boring monitoring work in the Future Factory, but I am able to workout during work hours in the factory gym halls*” (quotation from future scenario 2008). Most scenarios described future technology as automated, however, one story was of a future factory in a developing country where employees worked long shifts, with heavy monotonous task, as “...*humans are cheaper and easier to replace compared to machines*”, and in which “...*the employees are happy for the chance to earn some money, as work is difficult to find these days*” (quotations from future scenario 2008). Some of the young people’s concerns were expressed as “...*the mass-production of worthless products*” (quotation from future scenario 2008) and “...*factories that destroy the environment and pollute the earth*” (quotation from future scenario 2008).

An overall central point expressed in the scenarios was an ambition to do something valuable, for example, for humankind or for the earth. This ambition was expressed both as to making sure that the work environment in the Future Factory is ergonomic and safe, and as doing good for others and for the environment as part of the Future Factory responsibilities. The following quotation from one of the scenarios illustrates this:

“To work within industry must be a ‘good’ job. Something that people all around the world benefit from. The workplace should be well designed, as a work environment should be, not as they are in factories. Every employee cares for the environment and society as much as I do. I would like to be a person that comes up with solutions for a better future for all humans, including solutions for better working environments.” (Quotation from future scenario 2008)

The Scenario-based approach in this workshop provided a rich material of these young people’s perceptions of current industrial contexts and their ideas for future work and workplaces. Hence I consider the Scenario approach a valuable and relevant method to gain insights about various experiences and perceptions.

The Scenario-based workshop approach also gave something back to the actors. Several of the young people talked to me afterwards and said that it was great to be encouraged to really think about what they wished to do in the future. They also seemed really interested in what would happen afterwards in the project. Would we actually build a new factory based on their principles? This was not part of the project objective, but it was inspiring to see

their commitment. They were fascinated by the idea that their future scenarios could mean something to others, and also that their ideas were important enough to include in a research project. I consider this to illustrate a need, in various ways, to embrace young people's ideas to a larger extent.

## **THE IDEALIZED FUTURE SCENARIO APPROACH**

In the project approach, young people's diverse experiences and perceptions of the industrial sector were explored in the first activity and the consequences of their attitudes and values were subsequently explored with the other project participants. The idea was to present the young people's scenarios, the question was how to do it.

Weber (1983) describes ideal types as refinement of aspects in a research material that is purified until sorting out certain phenomena. Ideal types are in this sense theoretical constructs that do not exist in their pure form in the 'real' world. Likewise, the idealized future scenarios are not the young people's constructs. However, as they present the research material from the young people's scenarios in refined form, they can be seen as valuable tools for illustrating various attitudes of the industrial sector. The Idealized Future Scenario approach can therefore be seen as a tool for communicating certain phenomena and for discussing the consequences of this.

The refining of the young people's scenarios was conducted in a similar way to the Persona development process. The scenarios were analysed and explored in the search for overall patterns in the material. As it was obvious that some expressed negative opinions instead of future ideals, the two overall patterns were framed as Utopia and Dystopia. The young people's optimistic future expressions and ideals were consequently summarized in one new scenario, and the more cynical expressions of concerns and fears were summarized in another scenario. The ambition for the idealized future scenarios was to challenge or provoke prevailing logic, that is, in order to create what Schön (1973) refers to as an imbalance of stable states.

## **RELEVANCE OF USING SCENARIOS IN THE PROJECT**

The relevance of using scenarios in the current project was primarily for the purpose of spreading awareness of other perspectives and possibilities among project actors. In order to do this, the idealized scenarios Utopia and Dystopia were created. The idea of using idealized scenarios to challenge actors' mind-sets is similar to the application of Value Scenarios as described by Nathan et al. (2007). In this approach, a value scenario can be understood as an analysis of the consequences of a given solution. For example, if a new technology of some sort is under development, a value scenario is created to explore implications of that artefact in various situations of use, which are taken to their extreme.

This can be seen as equal to Latour's (2005) view that a notion of an object cannot be anticipated or foreseen, because intentions change with various users and usage. Thus, the artefact in his view becomes an 'actant' in itself, that is, the meaning of the artefact transform with context and user into a new meaning. In the previously described Value Scenario approach, strive is to explore various possible future usage situations, on multiple levels.

To use scenarios to better realize consequences of a change is therefore a way to understand some of the effects a design outcome can have, whether it is an artefact, an environment or a system.

The Utopia and the Dystopia scenarios from the current research are presented in the following section.

## SCENARIO 1. UTOPIA

The Future Factory is situated in a big city, although there are a lot of parks and green areas in the vicinity. The location ensures easy access to work and is in a community with nearby child-care centres, schools and shops. The Future Factory has clean, bright and airy working environments. The premises have nice interiors with 'modern designs' and the factory itself has 'modern architecture' that blends in with the city. All facilities are situated close to each other, contributing to a transparent and flat organisation. An important aspect in the Future Factory is the social responsibility taken on by the company's board and all of its employees. This includes environmental concerns being considered in every aspect of work and production and the company financing projects to assist the third world, for example.

The main part of work is done above ground, but some automated production is situated below ground and performed in office-like environments. The work includes creative tasks, with workers continuously learning and participating in the development of innovative production systems. Working in the Future Factory includes travelling opportunities and collaborating with a diversity of people from all over the world. All employees participate in product and production development. As an employee in the future factory, you have access to several facilities for sports and relaxation. It is a challenging but not physically demanding job, that is, technology does the heavy work without replacing the humans. Work colleagues in the Future Factory are committed to doing a good job, preferring to work in teams and having the social skills to do so.

Women and men work on equal terms. All employees feel important and needed. There are constant dialogues and participatory activities to ensure an open space with opportunities to influence the company, a good psychosocial climate and a search for prospective innovations. Working at the Future Factory is a respectable job for which each employee has been chosen with care and in which all employees make good money.



Photo 6. Illustrates a work environment of the young people's choice. Photo: Åsa Wikberg Nilsson



Photo 7. Illustrates the young people's preference for working in a city. Photo: Åsa Wikberg Nilsson

## SCENARIO 2. DYSTOPIA

The Future Factory is yet one additional plant destroying the earth. It is located in a designated area separate from human living zones, one in which no one cares about whether pollution and environmental toxins destroy nature. To be able to work here safely, you have to wear gas masks. However, no one does because the workers do not understand that the environment is dangerous and no one tells them.

This factory has these conditions because of humans' constant striving for short-term profits and the ever-increasing production of goods. In the past few decades, robots have replaced most of the human work force, although in recent years, humans have become cheaper than technology, resulting in that the Future Factory now is hiring personnel. The work involves monotonous and repetitive tasks in an assembly line, resulting in occupational injuries among most of the employees. Some job tasks consist of boring operating tasks, running the outdated automated production machines that still work. The working environment is dirty, and there is no way to see outside when you are inside the plant. Still, most workers are happy to do the job, because finding a job is not easy these days, even though the pay is not enough to feed a family.

Employees do not understand what they are doing or why they are doing the tasks. Nobody tells them about it. They have never seen, or let alone spoken to, managers, whom the workers refer to as the 'the invisible force'.



Photo 8. Illustration of the young people's concern over not being able to see outside. Photo: Åsa Wikberg Nilsson



Photo 9. Illustration of the young people's dystopian perspective. Photo: Åsa Wikberg Nilsson

## REFLECTION ON USING IDEALIZED SCENARIOS

A result of the use of the Future Scenario method is that it was a useful tool to 'simulate' or 'prototype' the future with various actors. The young people were for example in a way simulating their own future, prompted to reflect on what kind of future they would like to have, or not to have. The other project actors were also challenged to simulate alternatives they had not considered before in their reflections of the idealized future scenarios.

In my view, with terminology drawn of Brandt (2006), the actors in the Future Factory project explored the future 'what if'-worlds of Utopia and Dystopia, and were thereby stimulated to consider various alternative experiences and perceptions of the industrial sector. The scenarios could also be described in terms of projecting (DiSalvo, 2009), or predictive and prescriptive scenarios (Margolin, 2007), as the purpose in the current project was similar to claim for scenarios "...to make apparent the possible consequences of an issue" (DiSalvo, 2009 p. 52).

An implication of using the Future Scenario method is, as Sutcliffe and Carroll (1999) observed, that applying a particular method like scenarios can create a false reassurance that all aspects of a use situation are covered. For this reason, I stress the need to consider who is involved in exploring a future situation. In the present study, for example, the young people were not involved in the current situation of use. However, they may be in the future. And perhaps more importantly, in line with de Bono's (1968) argument, the young people were 'outsiders' and could therefore offer a 'fresh' point of view that challenged some other project actors' understanding of the industrial sector.

In the Future Factory project, the use of the challenge or the provocation of young people's idealized scenarios appears to have somehow disturbed or unsettled some of the other project participant's prevailing logic. Used in this way, the scenarios can be seen as stimulating "objects to think with", as Schön (1983) proposes. In the current research, the principal relevance of this was to stimulate reflection and thereby promote awareness and understandings of alternatives.

The project's actors' reflections on the Utopia and Dystopia scenarios were therefore somewhat unexpected as the participants considered Utopia being a description of a current state. This is illustrated in the following quotation from a follow-up interview:

“This is just like a description of our corporation! This is certainly not utopian. This is how we work today. Then, perhaps we can't be in the middle of a big city. However we work actively with parks and green spaces, because it's nice and because it picks up dust and makes a better working environment. We try to make our premises attractive and nice, but it's not easy with an old plant. We would like to have this transparency between different activities, but as I said, we have the buildings and premises we have. However, we try to find tools for better communication and cooperation.” (Quotation from interview 2010)

This is relevant because it seems to indicate that the internal industrial sector project actors had a different opinion of their work and workplaces. This perception of the industrial sector at least seemed not to be shared among the young people in this study. Hence, the reactions to the Utopia scenario as a fantasy or unrealistic, was not what some project team members initially anticipated. The Dystopia scenario however seemed to contribute to provoke the project actors' own 'mental models' of industrial contexts. This is exemplified in the following short quotation from the project:

“Wow, that was really bleak! However, I can't see this coming. People demand more today, not just work for eight hours or so. They want fulfilment and challenges as well. But we have to consider how to become more attractive employers.” (Quotation from interview 2010)

A result of the current Idealized Future Scenario approach is that the scenarios contributed with some awareness of the symbolic character of industrial work and workplaces. The perception of the industrial sector may depend on various aspects on multiple levels. However, the use of the Idealized Scenario method illustrated a gap between internal and external actors 'mental models' of industrial work and workplaces, and therefore illustrated a way to challenge prevailing logics.

## 6.4 DESIGN SPACE EXPLORATION

The aforementioned probing of change by design was in the current research done through the 'design lab' approach. This included the whole process from preparation and inspiration to collaborative workshops with the interest groups of trade unions, young people, industrial management and employees. In addition, since there was particular emphasis on women's needs and preferences, in this project one of the interest groups consisted exclusively of women.

Since a variety of stakeholders were involved, this meant both communicating various perspectives between interest groups, as well as exploration of each group's preferences and experiences. The results of this are further described in this section.

### WORKING WITH VISIONS

The research approach of working with a collaborative future vision of work and workplaces in the industrial sector was considered as new and interesting by several of the participants. As previously affirmed, the common approach to change was described as undertaken by a few managers and production engineers, discussing current problems rather than thinking in terms of various alternative futures.

The probing of Lewin's (1951) field theory of addressing the whole system, in the current research involved strives to emphasise the parts of work tasks, work place, work organisation, and work technologies' correlation with experiences of an effective, attractive and innovative future factory. To state that we in the project should work with visions was easy. To actually implement thinking innovatively in alternative solutions was another thing. This required that the actors reconstructed their understandings of the present.

In the Future Factory project, the collaborative activities were initiated as the Future Workshop experience phase of exploration of 'what is'. The discussions, for example, concerned aspects of industrial workplace cultures that contribute to a symbolic male identity, and consequently the

aspect of women perceived as differently. Some of the participants referred to this as the “...*obsolete male workplace culture*” (quotation from workshop 2009). An argument therefore was that some unwanted behaviours could be reduced or eliminated, that “...*considerate and empathic design of work environments encourages good behaviour*” (quotation from workshop 2009).

Various proposals of what the participants perceived as good work and workplaces were discussed in the workshops. The aspects that all project participants agreed upon as important were: light and clean environments, common meeting places integrated in production, modern design of material, furniture, environments and equipment that communicate company-owned products, and integrated areas of production and support systems.

Thus, one result of the design lab approach is the contribution to awareness of workplace design as a factor of being an employer of choice, as is also indicated in the following quotation:

“If we are talking about the future, I believe this with aesthetics will become increasingly important. The symbolic dimension of the factory, both inside and outside, is a factor for increasing competitiveness. Using aesthetics in various ways, designing good working environments, and intensifying marketing, both internally and externally, are means for this.” (Quotation from workshop 2010)

In general, it therefore seems as if the Swedish industry sector has not previously acknowledged the contribution of the built environment in supporting or interfering with productive, attractive, and competitive work and workplaces. The awareness of the importance of the workplace design was by several of the participants expressed as a future vision, something new for which they wanted to strive.

In contrast, others questioned the futuristic aspect of such visions. For example, one participant stated:

“In the project, I think that the discussions were sometimes quite narrow-minded. The thinking of alternative solutions of integrating various functions, open office facilities, and so on: It is not new by any means. But perhaps it is new to this business, or at least it seems to be that way. (Quotation from follow-up interview 2011)

The question hence is whether the alternative solutions actually were new and new to whom, as posed, for example by Johannesen et al. (2001), although thinking in terms of workplaces with integrated functions and office-like facilities was considered new by some of the project actors.

However, as Rogers claims, an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption (2003 p.12). In this view, it does not have to be 'objectively' new: If an idea seems new to an individual, then it is an innovation for that person. In the project, it was a challenge to get all the project actors to think in terms of innovations. Relevant in this, I think is the starting position each individual has. While some actors felt that some things were radically rethinking, others consider them as solutions that already exist in other businesses. This was a challenge, to stimulate, provoke and plead for thinking innovatively on multiple levels.

## **COLLABORATIVE DESIGN**

One difficulty in the collaborative activities in the project was the different types of businesses that the participants represented.

For example, the food industry actors had several hygiene factors that significantly narrowed the scope for solutions. The process and manufacturing industry actors had other aspects they considered important. Some of the discussions hence were narrow-minded, in the meaning that some of the actors could not consider solutions beyond their own type of business.

Working with stakeholders is rather different compared both to traditional research and to design practice. There are, for example, arguments for stakeholders not being able to contribute to future radical designs, because they cannot liberate themselves from current solutions or usage situations. This is, for example, expressed as that "...user-led design leads to sameness" (Skibsted & Hansen, 2011). In support of this statement, a quotation of Henry Ford arguing that "...if I'd have asked my customers what they wanted, they would have told me a faster horse" (see Skibsted & Hansen, 2011).

In the current research, the idea was to work with a variety of actors to stimulate thinking innovatively, and to realize alternative design of work and workplaces. I consider

the idea that user-led design leads to sameness to relate to Norman's (2005) consideration of human-centred design addressing the wrong issues. In this view, the emphasis in user-centred design should be on explorations of experiences that can be used as inspiration for design. Thus, the emphasis is not on the explicit statements, but rather on the joint collaboration and the exploration of what makes sense in a particular context. Inspired by this, the emphasis in the current project was a probing of various experiences in everyday work situations and workplace activities that can contribute to desirable future solutions. Like Haraway (1997), I consider this to illustrate the need for serious reflection on alternative understandings and solutions, what she refers to as undertaking 'diffraction'.

A result is therefore that the collaborative approach of working with visions requires being able to move beyond one's own ideas and current business, through subjecting oneself to considerations. It also involves seriously engaging in exploring various other's experiences and perceptions. Most of the actors were engaged in the explorations, and thereby probed alternative solutions that were radical innovations for them.

This is illustrated through quotations from a discussion in one of the workshops, just after they were introduced to the Personas, see Figure 15. In these expressions, I consider that the emphasis on the Persona's experiences can be noticed. Therefore, I think that the approach of emphasizing various experiences in work and workplace design was successful. It contributed to a collaborative design that goes beyond participant's own ideas into the realization of alternatives. In some sense, the Persona experiences therefore guided the discussions. This is also the objective of the Persona method (Cooper, 1999), meaning to spotlight some particular users in a specific context.

A concrete result of the approach in the current research is therefore the contribution to challenge the 'bounded technical rationality' (Schön, 1983) in embracing humans' various experiences in the design of work and workplaces.



Figure 15. Quotations from a project workshop 2009.

## **GENDER-AWARE DESIGN**

The foremost contribution of a gender-aware design can be exemplified in Kanter's (1988) argument for innovative cultures to exist in an organisation that has integrative structures and cultures that emphasise diversity. However, as in discussions within the YCC project (Peterson McIntyre, 2010), it proved difficult to challenge gender constructions. Although participants discussed women not having to change behaviour in order to be accepted in factory work teams, the dominant logic was that of women being 'different'. As one participant put it; "...if women aren't different, what's the reason for having more women in the industrial sector?" (Quotation from workshop 2008).

This is of course a relevant question that was discussed in the project. Equality for its own sake was not an accepted argument. The underlying question was therefore for them: How does it gain us. This is not an easy question, and not within my remit to elaborate. An interesting paradox was some of the project participants' questioning of the actual benefits of having more women employees, at the same time as they said that they wanted to change the symbolic association between men and industrial work and workplaces. To change the symbolism would in my view involve an emphasis on experiences, rather than a one-sided focus on technology in work and workplace design. To change the symbolism into an alternative gender-aware work and workplace design, therefore, in my view requires an understanding of the present gender system. For this purpose, Acker (1999) proposes analysing gender constructions in organisations, see Figure 16 for my version of this framework.

The idea of gender systems in organisations was mentioned in project activities, but we could have worked more with those ideas in the project. As a middle-way, the possible benefits of becoming more innovative, such as becoming competitive through the development of new products and production methods through the inclusion of a diversity of skills and experiences, seemed as something all the project actors could agree upon as beneficial.

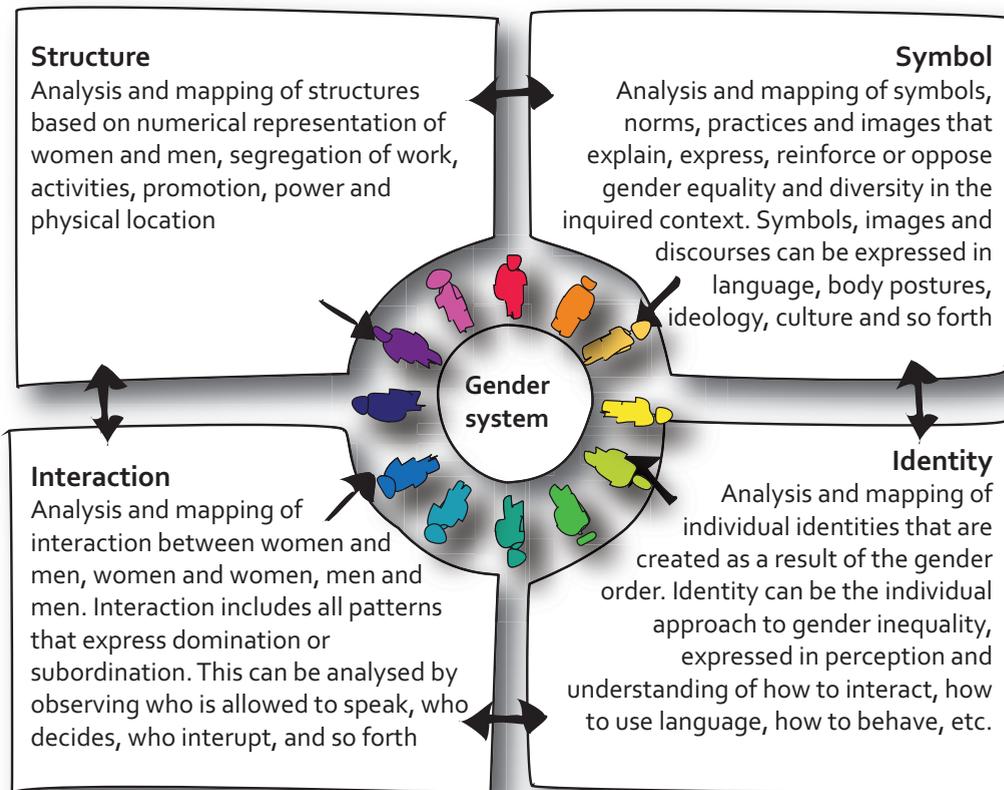


Figure 16. Framework for analysing gender systems.

Instead of working with analysis of gender systems, the participants in one workshop developed a Persona that the vision of the Future Factory was to 'satisfy'. As the Persona was called, *Svea* illustrates a rather idealized situation. An implication of working with future ideals can therefore be a return to gender-blindness. As one of the project objectives was to illustrate that unawareness of gender contributes to stabilizing unequal gender systems, as proposed among others by Abrahamsson (2000), this can be seen as an obstruction. A result of this is therefore that it is easy to disregard gender when working with future visions. Whereas the future ideal, that is, how it ought to be, may involve

discounting gender as an issue, the implementation of such future states requires challenging or provoking gender construction (Haraway, 1997; Acker, 1999; Butler, 2006).

Therefore, to analyse organisations through the previously-mentioned framework, or to implement the previously introduced Switched Gender Persona method, can be tools to realize consequences for a variety of people in alternative solutions, and thereby a contribution also to increased gender-awareness.

Persona Svea is however an important result of the activity, both in terms of the illustrated awareness of a need for integrative workplace cultures and diversity in work teams, as well in the application of a collaborative development of Personas as a research method to embrace various experiences, see 'Svea' in Figure 17. The idea of having women role models was discussed during the development of Persona Svea. The symbolism associated with the industrial sector was something that the participants felt could be changed through communication of a new industrial worker identity. This is illustrated in the following quotation;

“In one of the workshops we discussed that the only time you see a blue collar worker in media is when a factory is closed down. Industrial workers are hence portrayed as both dirty and depressed. This was really a wake-up call for me; we must work more with giving positive images of the industrial sector. So, I think really good things came out of this project, and as I said, foremost the emphasis on the people working in the sector” (Quotation from follow-up interview 2010)

Apprenticeships, seminars in schools, and having more workplace visits were some of the solutions that were discussed. An implementation of all of the ideas that came up in the project could possibly contribute to a change of the symbolism that is associated with current industrial work. Thereby, I consider that the implementation of a design approach contributed to actors' understanding of various parts of industrial work and workplaces as important to address as correlated, in order to reach the synergetic holistic effect in an effective, attractive and innovative future factory.

# Svea

Svea has worked at the factory since she left school 12 years ago. At school, she received an internship and spent it at the factory, now she works there herself. Svea works in a team responsible for several different types of operations. She likes her job, but believes that it is always possible to do better, right now she thinks of how it can be easier to follow an order all the way through production.

Both improvement and innovation work are things something all of the staff is involved in, it has also proved useful in more efficient production and better product quality. The best thing is that everyone is fighting for the same goal, says Svea.

**"We have very high demands on our working and production environment, and the company must live up to this "**

One aim is to have the same conditions for everyone, no matter what role they have, what age or what gender.

Svea is responsible for spreading information about the Future Factory in schools, every now and then she is off to various activities to present what she is doing at the factory. She also is a mentor for those who come for apprenticeship;

**"It's fun to mentor, I am forced to think about what I do and it's fun to teach others."**

**"The factory takes care of creativity and problem solving skills among staff, we have brainstorming sessions every now and then!"**



Figure 17. The future scenario of Persona Svea (author's translation of workshop material).

## THE VISION OF FUTURE WORK AND WORKPLACES

All the project activities, the interviews, the observations, and the workshops, provided a rich material of alternative ideas and solutions.

For me, design concerns making things that people values. It involves analysing the patterns of a situation and restructuring those into a coherent whole, something that make sense, and that provides additional value. Design hence involves both a thinking activity and an executive activity. For the participants to experience the performing of design, this involved re-thinking work and workplace design based on experiences. Also, the execution activities were in this project undertaken as a probing of methods and tools for work and workplace design.

In the activities, the workshops turned from thinking into executing when I introduced some material that the participants could use “to think with” (Schön, 1983). For example, in one workshop the participants worked with what was referred to as an ‘iWorker’<sup>24</sup>, with inspiration from Ehn and Sjögren’s (1991) description of working with ‘boundary objects’ that are understandable, and easy to relate to. The idea was that this would result in thinking in terms of alternative futures instead of present states. This was also what happened, as some immediately started to ‘use’ the object, illustrating with their whole body what it could be and how it could be used. The ideas of alternative solutions that came up were to have a technological device that would contribute to a widened understanding of the whole production system. As it was called, the ‘iWorker’ were to be filled with useful applications, ‘apps’, such as to make your own work schedule, an individual health profile app to stimulates exercises during work hours, to have safety warnings, to have continuous updates and information of production processes, to be able to document work processes and production mistakes, and so forth. Such a device would in turn influence the workplace, as there would be no need for specific operating rooms. Instead the personnel could

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<sup>24</sup> The inspiration for this came from another research project working with ICT devices within some Swedish industries (see Nordin et al., 2010; Fässberg et al., 2010). The participants in our workshop were given an object to ‘work with’ and material from this project as inspiration for their work

move more freely around the workplace. The organisation would of course have to be transformed to allow for more on-the-spot decisions.

The ideas about the workplace as previously noted concerned modern environments with integrated support systems. The participants discussed 'transparency', not only as participating in decision-making and development projects, but also as transparency in the materials used in the workplace. One of the discussions was that the built environment should support the production-specific material. The built environment for a steel production company could hence be a combination of steel and glass, for a plastic production company there could be plastic combinations with glass in various colours to market the production in the built work environment as well.

In these various ideas, the understanding of the aesthetics of the built environment as a contribution to both internal and external stakeholders' perception of the company was said to be of great importance. One alternative solution for a future factory was the idea of a circular building in which the production flow was undertaken in various sections. The intention was for some of those sections to be open to the public, thereby showcasing production that could contribute to spreading knowledge and understanding of high-tech industrial production, and the 'new' industrial worker identity. As the factory was to be placed in a city, the actors discussed having a restaurant inside, in which one attraction could be to watch the modern production environment and processes. In the discussions, an important aspect was that the future workplace should have easy access to transportation and logistics, and be located close to shops, schools, childcare centres and so forth.

Another discussion concerned the idea that in-house research and development will be increasingly important in the future. This is due to a toughening competition, and in-house product and production development will hence be required to remain competitive, according to project actors.

Discussions also dealt with finding the perfect work method as part of that development and something that could stimulate employees to take a more active part in development. Allowing for shop floor workers to be participating in technological development was one alternative solution to being proactive rather than reactive.

During another activity, discussions dealt with the reduction in shop-floor workers in favour of production engineers, who were seen in the industry sector as the group of future increasing demand.

In all of the discussions, I consider that the design approach applied contributed towards actors' addressing the part in relation to the whole, exemplified in their discussions on how the various ideas and solutions would contribute to the other parts, and increase value for both internal and external stakeholders.

The outcome of the Future Factory project was summarized in a future scenario, which illustrate the vision of industrial work and workplaces in an attractive, effective and sustainable future factory, see Figure 18 and Figure 19.

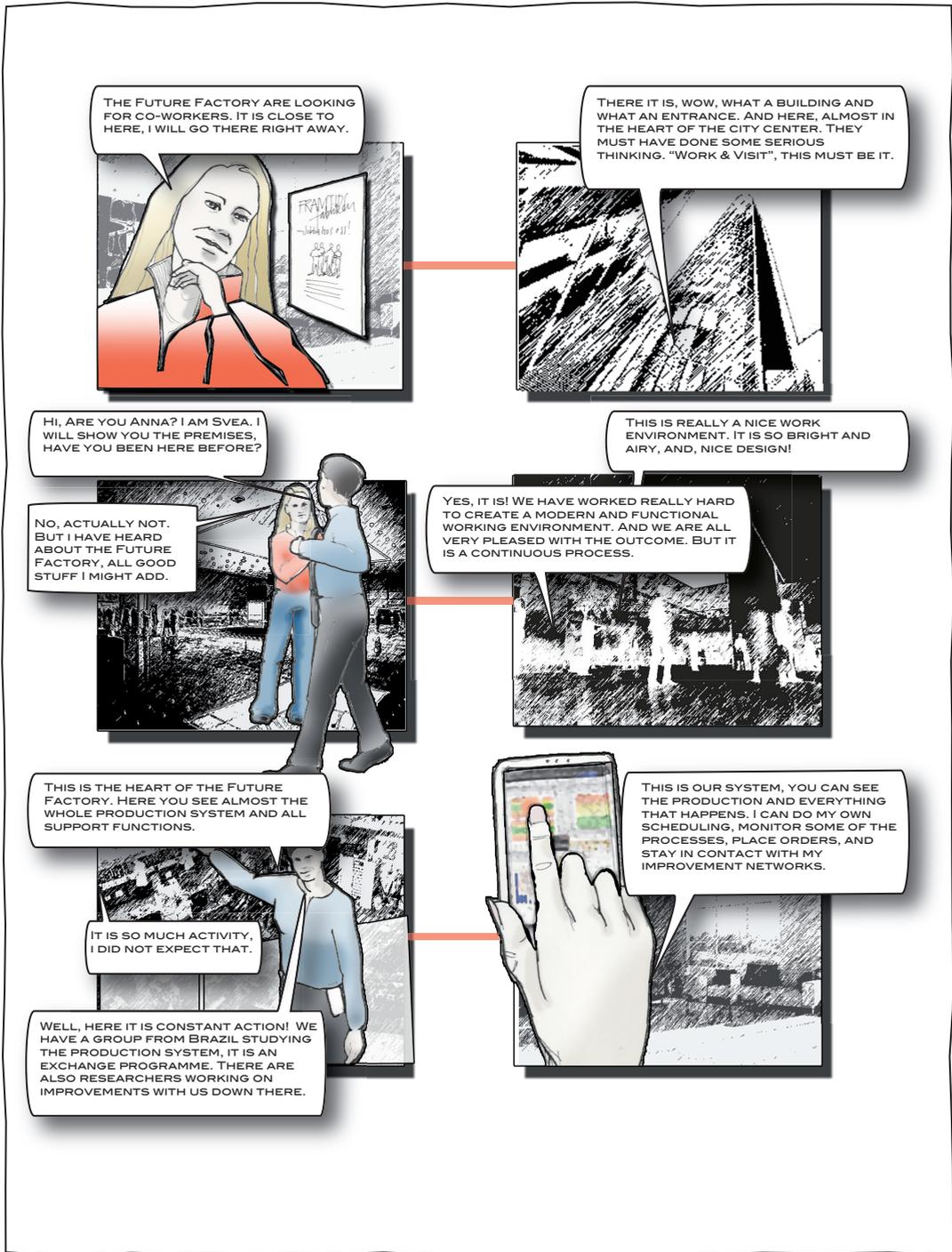


Figure 18. Future Scenario 1 (2).

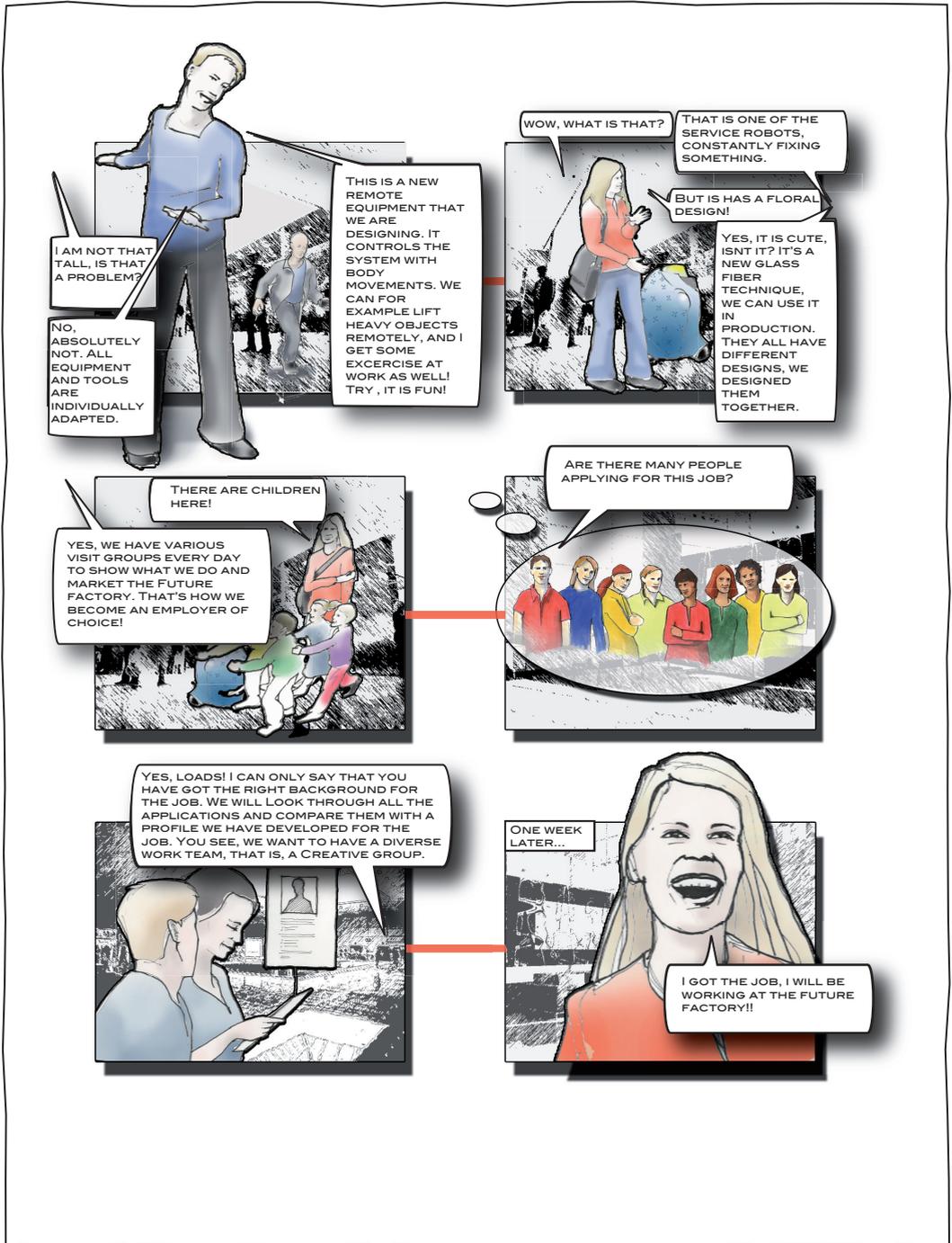


Figure 19. Future Scenario 2(2).

# 6.5 GUIDELINES

I conclude this presentation of the results from the current research by presenting some guidelines and methods for work and workplace design. The ambition is that these can contribute to an understanding of how experiences are parts of work and workplace design.

## GUIDELINES FOR A FUTURE FACTORY

The vision of a future factory can be summarized in the following guidelines for efficient and attractive work and workplaces.

Respect context. The physical workplace is perceived on multiple levels. For example, the workplace is part of the value in the local region, part of the value of the trademark, as well as a part of various individual values, both internally and externally. Investment in workplace beyond technology can hence pay off both in increased individual value, as well as in an increased employer and corporate brand.

Buildings and workspaces should promote both functional and social interactions. The working place (including production areas, supportive function areas, lunch rooms, internal connectors, atriums, lobbies, goods, surrounding green areas, etc.) has the potential to combine the diverse elements and maximize the opportunities for functional and social interactions. Provide spaces for both planned and spontaneous creative meetings, conversation, relaxation, network meetings, and so forth.

While there always is pressure to minimize spaces in buildings, a good workplace design depends on the balance between functional and social factors. Design production flows based on human's location rather than production technology placement. Plan the workplace so that people are able to talk to each other during working hours, both within work team or work divisions, and between functional areas. Incorporate various support functions within the production environment to make the whole work system more flexible and dynamic.

Plan the workplace with respect to context so that employees, production, materials, buildings, spaces, designs and company vision and mission contribute to a cohesive whole. The workplace should contribute to meet the needs of both present and future users. For work and workplace design it involves designing for flexibility, adaptability, equality and diversity without compromising the needs of the present users. Investment in work technology, equipment, buildings and premises should always be planned and implemented based on both performance and affordance.

Consider each change and development plan in relation to the whole work system. New technology or equipment can both contribute and implicate other areas. Allow employees to participate in planning and decision-making, in order to avoid misunderstandings.

Contribute to innovative workplace cultures. Work teams should be composed of a diversity of people with different backgrounds, skills, experiences, genders, ethnicities, religions, education, and so forth. Creative teams should involve active team building of individuals and groups, which appreciate and develop each other's various skills and experiences. Reflect on the diversity principle for people's participation in all workplace functions. Think based on what skills or competences are missing, whether this concerns par-taking in decision-making, change or design processes, for recruitment, or for further training.

Contribute to a widening awareness of 'doing gender', in a strategy of implementing balanced work groups, on multiple levels. Focus on individual skill and experience, rather than gender or ethnicity. Implement a strategy of having role models or mentors on all levels. Discuss work place issues in relation to gender theories.

Allow for learning-by-doing. Support the search for both continuous improvements and new alternative solutions. This should be implemented as a proactive strategy of building a knowledge bank of various work task performances and production methods.

Recognize both individual efforts and team achievements. Let the work team identify own skills and experiences, and recognize

what could benefit the team as a whole. Allow for critical reflections in implementing a strategy of continual re-constructions of understanding and knowledge. Contribute to an awareness of the value of a variety of skills and experiences, whether provided by women or by men. Implement both individual and group strategy planning for development, education, further training, and so forth, on a regular basis. The investment on employee's continuous learning and development contributes to both increased internal and increased external value.

Develop work tasks that are challenging and that contributes to continuous learning. Work rotation both within and outside the organisation, as both internal and external internships allow a growth in skill and experience that increase value both for the individual and the company. Understanding and knowledge of the whole work system, as well as other work systems, contributes to thinking of alternative solutions.

Respect that individual productivity varies throughout working life. Develop a strategy of assisting with flexible work hours, individual schedules, health profiles, life coaches, and so forth. This contributes to decrease staff turnover, strengthen company loyalty, and increase individual value.

Global markets and rapid changes of technology require more flexibility rather than less. Build networks of various skills that can be used by different companies as a way to solve flexibility, without compromising with safety at work.

Utilize networks of employees, suppliers, customers, and partners in a continuous search for new opportunities. Invest in corporate social responsibility on various levels. Allow employees participating in development projects, such as, for example, local region development, apprenticeships, third world projects, or projects exploring opportunities to increase environmental awareness and decrease costs in the own organisation. Implement a strategy of working with future scenarios on a regular basis as a way to stay proactive. Allow all workplace functions to contribute in the scenario development and use networks to explore alternative future perspectives.

# GUIDELINES FOR DESIGN LABS

The idea of change by design can also be implemented as a proactive strategy of small-scaled 'design labs', laboratories for change, within companies. How to approach the method of 'design labs' obviously depends on context, there is however some general guidelines that can apply for work and workplace design, outlined in the following section.

Map context. An initial context mapping should be open and implement experiences and values on multiple levels. Map context in terms of workplace structure, organisational symbols in text and images, internal and external interactions between people, divisions and functions, as well as individual experiences, values and identities. Notice discrepancies between what people say and do through, for example, participatory observations.

Map experiences. Explore various experiences of the work and the workplace, both via internal and external stakeholders. Discuss both good and less good experiences that can be used as examples in the upcoming work. Visit other workplaces to learn of alternative solutions and to get inspiration. Discuss alternatives with a variety of people on multiple levels to embrace a diversity of perspectives. Explore the existing driving forces for change and development and build further on them, that is, go with the river flow.

Explore the material. For example, create Personas to communicate and explore various problems or issues without compromising individuals. It is important that the Personas are used as discussion subjects and not as posters on a wall, in order to avoid stereotypical assumptions. Switch gender, ethnicity, age, work tasks, and so forth, of the Personas to realize issues and presumptions. Use the Persona scenarios as starting point for critical reflections of how it could be. A gender perspective on change by design contributes with the contestation of normative logics, strategies, and practices.

Challenge and question dominate beliefs. Start from exploration of how it ought to be, explore a variety of alternative solutions, employ an attitude of deeper

understanding of various perspectives, and always reformulate given problems. Instead of asking what is to be designed, ask why, and ask for whom, that is, reconstruct given problems, redefine limitations and statements, and thereby communicate alternative understandings and solutions.

Take action. Workshop sessions should involve doing, rather than talking, as actions stimulate reflection, motivations, reasoning and latent hopes and desires. As facilitator it is important to stimulate action, whether through, for example, writing on post-it notes, sketching, making mood boards, creating future scenarios, playing design games, or by building simple prototypes. Discuss alternative solutions in a continuous iterative process. Use solution concepts to understand and to explore the context. As the iterative process continues, and hence as understanding increases, the prototyping of solutions can be more detailed and more sophisticated.

Make scenarios. Implement a strategy of proactive creation of future scenarios in collaboration with various stakeholder groups. Use the Idealized Scenarios method to critically reflect on various alternatives.

Create goals. To go from design labs to implementation requires transformation of realized insights to future actions. Create goals based on the ideal future scenario. For the new solutions to be sustainable requires that the entire workplace recognizes and acknowledges the need and basis for the solutions. Involve people on multiple levels in the future explorations and allow them to be part of realizing that future.

Think radically new. Thinking innovatively should ideally be a little 'dangerous', bordering on what is considered comfortable or appropriate, to really challenge dominant ways of thinking. This involves exploration of individual and collaborative 'experienced realities', different perceptions of the world around us. It involves things taken-for-granted, norms, experiences, knowledge and understanding that both can be a prerequisite, but also a hindrance to creativity and innovation.

## 6.6 REFLECTION-ON-ACTIONS

In this section, I will make some final reflections on the chosen methods and the actions taken in the current research work.

### DESIGN LABS AS ARENAS FOR CHANGE

The collaborative activities in the current project could be referred to as explorations of change and thinking innovatively.

The creativity or the ability to think innovatively varied a lot. Some of the actors that I before project-start considered would be difficult to get into a creative mode really surprised me, and vice versa. What is proposed as a bounded industrial rationality on efficiency (Rittel & Webber, 1973), was difficult to challenge in this project. However I consider that the design lab approach contributed to project actors' initiation of thinking differently about work and workplace design.

Working with a group consisting exclusively of women was a new experience for me. This was part of the project set-up, decided before I entered into the project. In retrospect, I consider that it was a good approach, and also something that can be valuable to undertake within companies as well, as a short-term strategy to better emphasise minority groups' experiences and perceptions. I am aware that this may contribute to stereotypical assumptions of women having different needs and preferences compared to men, and consequently women being different, as noted by, for example, Styhre et al. (2005) and Peterson McIntyre, (2010). For this reason, it is important to mention that the notion in the current research was not that work and workplaces based on women's ideas, needs and preferences should be more human, softer or simply just more 'female'. Rather, instead the idea was to work with a homogeneous group of women to challenge and address the prevailing predominance of men in decisions and design of work and workplaces. The intention

was partly to bring to a general attention and to discuss the issue of men's ideas not necessarily being gender-neutral or all-embracing. This was also observed by some of the participants in the women's interest group, as some of them stated that they had worked in groups with only men beside themselves at several occasions. Therefore, they concluded that it could be appropriate to work with only women occasionally as well.

In line with most of the project actors' arguments, I consider that the general rule should be that of embracing diversity in work teams in order to develop innovative workplace cultures. Ironically, the project focus on women's needs made some of the participants feel that the solutions were too human-centred. The contribution of a reflective design approach to a challenge of a bounded technical rationality was part of my objective, but some of the participants thought that it would contribute to a stereotypical assumption of women as only interested in 'soft' values. This was a dilemma and made it difficult to discuss experiences and gender in relation to work and workplace design. For this reason, it would be interesting to work with an all-male group with a reflective approach, as in my view it should be a concern for everyone to emphasise human values.

I consider that the reflective design approach applied in this project made the participants aware of alternative solutions. Although it has not been something that was included in this project, the participants also have the ability and capability to implement some of the project ideas, approaches or methods in their own businesses.

The diffusion of innovations can, as Rogers (2003) argues, be seen as the process in which an innovation is communicated through certain channels over time, among members of a social system. The social innovation of the Future Factory project can be considered as the diffusion of the ideas of a reflective change through design labs that illustrate possibility to contribute with value for a diversity of people, processes and possibly even societies.

## CONTRIBUTION AND FUTURE WORK

The research presented in this thesis contributes to both practice and theory with methods, tools and guidelines for a reflective and innovative work and workplace design, further defined in this final section.

The rethinking of the Persona method illustrates possibilities to contribute to a humanization of work and workplaces. This can be the outcome of emphasise on experiences and values. In addition, such a strategy may contribute to effective, attractive, and innovative future factories. The reason for this is that the involvement and contribution of co-worker's in continuous development of work practice, processes and products may contribute to company loyalty and reputation, as well as realization of alternative and possibly innovative solutions.

Another contribution is the method development of both Switched Gender Personas and Idealized Future Scenarios that illustrate possibilities of being ways to initiate critical reflections. Also, the implementation of the Persona method can be a contribution to humanization of work and workplace design through the emphasis on experiences. The Idealized Future Scenarios also contributes with being one way of illustrating various experiences and perceptions of certain contexts. In the current case the context was industrial work and workplaces. However, the implementation of Future Scenarios could equally contribute with being one way of pre-experiencing products, services, systems, or environments. Hence, it is a pragmatic method that can be applied for a variety of practices.

The overall implementation of a design lab approach, I consider have potentials of contributing to any work practice with a continuous employee partaking in decisions, planning and development of work. In addition, it can be one way to the development of an innovative work place culture.

The theoretical research contribution is the correlation between the concepts of change, learning by doing, experienced realities, doing gender, and the reflective practitioner. In summary, the concept of change does according to Lewin (1947) involve practical actions of exploring the context and the situations in collaboration with the people involved. This involves actions that provide

knowledge and understanding, hence what Dewey (2008) refers to as '*learning by doing*'.

Moreover, a consideration of a diversity of '*experienced realities*' (Dewey, 1998a) in design processes could contribute to outcomes that better fit in its context. The implementation of the concept of '*doing gender*' (West & Zimmerman, 1987; Acker, 1999) illustrates how '*realities*' are constructed as situated practices and actions. *A reflective practitioner* (Schön, 1983) has tools for challenging stereotypical assumptions and challenge dominating logics. Hence, I consider the correlation between these concepts as contributing to a rethinking of design as an activity of reframing mind-sets and thereby better thinking innovatively. The diffusion of such design thinking could impact practice, as more and more people realize the need for, and experience the joy of, participating in developing positive changes.

The main argument in this thesis is that a 'design lab' approach can contribute to innovative thinking and gender-aware design, through questioning and challenging the ways things are, and imagining the way things ought to be. This involves a need to reconstruct and reframe things taken for granted and stereotypical assumptions. A reflective work and workplace design in my view incorporates new ways of thinking and new methods in order to get radically innovative outcomes. As for future work, it would be a stimulating challenge to try to implement the guidelines, methods and tools in a work and workplace design project. This was also expressed by one of the participants, as illustrated by the following quotation:

"It would be really interesting to try these ideas for real, to see if it would add value and increase attractiveness to take all of those ideas and realize them in current business. That would really be fun"  
(Quotation from follow-up interview 2011)

Finally, my overall ambition with this thesis work is to contribute with a re-thinking of designing, in the sense of a rethinking of designing as collaborative 'design labs' that have a foundation in explorations of values and experiences. This, I consider as one contribution to making a positive change.





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# *Paper 1*



# Reflection-For-Action: A Collaborative Approach to the Design of a Future Factory

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## **ABSTRACT**

This paper describes a collaborative process of designing a concept of a future factory, in a three-year research project called “the Future Factory”. In the paper we aim at presenting our approach and some results from the same. We argue for a resumed discussion on future work organizations, and do so through the project aim of designing a conceptual future factory. The Future Factory project may be considered somewhat different from traditional research projects, since it includes a design team consisting entirely of women. The reason for this is that Swedish manufacturing industry is heavily male-dominated in numbers, and solutions based only on their ideas thus risk being incomplete or unilateral. The approach of the project encompasses multiple perspectives of values of industrial organizations. The main method has been participatory workshops sessions, in which we have explored contents of future factories together with our stakeholders. Our joint proposal includes aspects of gender awareness, participation in change processes, control of work situations; continuous learning and development in order to become both an attractive and efficient future factory.

**Keywords:** Participatory design, Reflection-for-action, the Future factory, Collaborative approach

# **INTRODUCTION**

There is a reason to argue that something needs to be done to resume a discussion on future management and work organizations (Isaksson, 2008). This paper describes the methodological approach of our contribution to such a discussion; a proposal of a future factory designed by both employers and employees and other stakeholders. The approach is applied in an interdisciplinary three-year project, called “the Future Factory”. This paper addresses the contributions from the field of design to the project approach, including workshop sessions that are inquiries into a future situation of use. The inquiry implies a search of participants’ understanding of values and needs. The objective of the approach is that ideas grounded in the participants own life- and work contexts, provides better conditions for an outcome that will fit in its context.

We draw on a tradition of a Scandinavian human-centered approach, initially focused on people’s use of technology but that today has a broadened scope of everyday life issues (Westerlund, 2009). One example from the early 80s is the UTOPIA project that dealt with design of, and training in, technology and work organization (e.g. Ehn, 1988; Bødker et al., 2000; Sundblad, 2000). An additional example is Volvo’s development of the Swedish Kalmar and Uddevalla plant (e.g. Sandberg, 2007).

Within the automotive industry it is common to develop a concept car, as a way of marketing business and test new ideas. Such a concept car is seldom produced (at least without changes), the purpose being to draw attention to the brand. The idea behind the Future Factory project is based on similar ideas; to develop a concept factory in order to draw attention to, not a particular brand but, to industrial organizations and their design.

## **THE FUTURE FACTORY PROJECT**

The Future Factory project is carried out by an interdisciplinary research group at the department of Human Work Science, Luleå University of Technology, Sweden. The team consists of seven researchers representing expertise in the areas of production systems, systems design, gender, organizational design, ergonomics, and industrial design. The practical aspect of the project is to explore the possibility to design a sustainable and at the same time efficient concept of a “factory”. The overall purpose of the project is to explore new approaches to change management and production design as well as to develop theories of organizational design in an industrial context. We base our approach on the notion that change management and developmental work must continuously be upgraded as the social context and the conditions of production change. Furthermore, from our perspective there is an emerging trend to encompass multiple perspectives within the field of ergonomics,

(e.g. Charytonowicz, 2009) something we find to be at least to some extent addressed in this project.

The Future Factory is a triennial project expected to be completed by the end of 2010 and that is performed in three phases; 1) knowledge overview and mapping of relevant areas such as inter alia contemporary manufacturing industry, new trends within production systems, organizational design, and change management etc., 2) exploratory study of social and organizational aspects together with the interest groups, and 3) design work, which includes working with a design team consisting of participating women production engineers, systems designers, human resource managers, CEO's, industrial designers, architects, students, and researchers.

## **AIM**

The specific aim of this paper is to describe our collaborative approach based on a design team consisting entirely of women and to present some of the outcomes that this has resulted in. Moreover, from our perspective there is a difficulty in transferring research discussions on work organizations to the people that have the ability to implement them in their organizations. Our approach includes participating stakeholders, and we thus want to contribute to transferring knowledge on these issues. However, we also see the participants' knowledge as something that will contribute to refining our approach and the methods used. The expected outcome of the project is thus a proposal of a future factory that includes needs and preferences of *both* women and men needs. Therefore, there is no particular problem, solution, organizational design or production system to explore. Research projects can explore how things are; the Future Factory project instead aims at exploring how things might be.

## **OUR APPROACH**

A design process can be performed in many different ways. The design process of the Future factory project focuses on a future vision of a factory, including ideas on organizational design, production systems, and information technologies. In extent research there is claimed that this makes the process more complex than problem-solving, meaning that requirements cannot be fully stated beforehand (Westerlund, 2005). Furthermore, such problems are proposed as "wicked"; as problems that cannot be definitively described and that involves aspects that cannot be solved neither correctly nor falsely (Rittel & Webber, 1973). As a result, our driver to start a design process has not been problems, but instead to develop a future factory based on new perspectives, possibilities and visions.

A design process is often described as a linear process starting with a problem and ending with a solution to that problem. Such a process is often based on various disciplines contributing with their expertise at different stages during the road. For

example, the marketing department performs a mapping of needs and then forwards them to a designer. However, Westerlund suggests that this is a waste of understanding since not all relevant knowledge can be represented this way. In contrast, there is an emerging trend to engage people from different disciplines in the design process, an approach also applied in the Future Factory project. Henderson (2005) suggests the approach of interacting needs of technology, user value, business value, and strategic value. Moreover, he emphasizes the importance of addressing all these values at the same time.

Given that we in this project are trying to include all dimensions, we consider it important to address all these values in our activities as well. Our solution to this has been to form a multidisciplinary design team, as previously mentioned composed of production engineers, systems designers, human resource managers, CEO's, industrial designers, architects, students and researchers. What makes this project different, and from our perspective exciting, is the fact that we have chosen to work with a design team consisting exclusively of women. The reason for this is due to a problem faced by Swedish manufacturing industry; e.g. the dilemma of how to attract young people and women. Thus we want to explore a possible constitution of a future factory particularly with these stakeholders. In addition to this, Swedish industry as a whole is heavily male dominated in numbers, meaning that women are excluded from organizational design processes. Solutions based solely on men's ideas and visions are not general and their solutions often are not all inclusive, and thus risk being incomplete or limited.

The expected outcome of the design process is a proposal for a future factory, i.e. a visualized model of a future factory including ideas based on women's preferences for a; production systems, organizational design, and change management.

Krippendorff (1995) argues for a development process that has a network of stakeholders, since he believes design to be a social process that relies on stakeholders with different and potentially conflicting interests. An approach based on this perspective is sometimes described as an inquiry into a future situation of use (Gedenryd, 1998). From our perspective such an inquiry builds on people's own experiences and provides resources for them to be able to act. For us, such an inquiry includes an understanding of the situated work practice and human factors as a ground for technology and system development, as suggested by e.g. Heath and Luff (1991), Suchman (1997) and Bannon (1998). A proposal is that if stakeholders are involved in the process, it ensures that its outcome will be better received and will be better adapted to their needs and preferences (e.g. Saschkin, 1984; Müller & Kuhn, 1993; Bødker et al., 2000). By reflecting on how manufacturing industries conceive the concepts of efficiency and attractiveness together with our participants, we therefore believe that it is possible to design a proposal for a future factory that benefits both organizational and individual perspectives. This means that the approach of the project builds on a model of design based on the notion that the interest is in how things out to be rather than how things are (Simon, 1969).

## REFLECTION

The concept of reflection was introduced by Dewey (1998/1933) and further developed by Schön (1995), who initiated reflection-in-action and reflection-on-action. The latter includes a process of identifying and developing knowledge of a particular context or workplace and the actions taken there. The process of reflection is according to this concept, claimed to deal with learning and thinking, since we are said to reflect in order to learn and learn as a result of reflection. Ghaye (2007) includes the analysis of what people do in the concept and consider it dealing with important work-placed based and profession-specific knowledge. Furthermore, he adds *reflection-for-action*, occurring for a reason, a particular purpose, and including elements of thinking of the practice in order to improve it, which is: plan for action. As mentioned, in this project there is no particular practice or context to reflect upon, however, there is a particular purpose upon which we might reflect, i.e. the design of a future factory. It is, for example, rare in Swedish industries to include all groups of employees in change projects (Bellgran & Safsten, 2005), even though it is described as a successful approach that would contribute to improvements (Vink, Imada & Zink, 2008). This might result in changes that are not based on the knowledge and experience of the organizations members, which might lead to restorative actions (e.g. Abrahamsson, 2002; Charytonowicz, 2009) and/or outcomes that do not work in their contexts (Ullmark, 1996).

To reflect is also described as looking forward into *what we want to achieve* (Ghaye). Such future scenario-making is also proposed as a more solution-oriented back-casting approach (Edeholt). The assumption behind this is that when thinking of a practice in order to improve it, a plan for action takes place. If planning is based on a future practice, *what might be*, and thinking of actions that have to take place in order to implement the solutions, the solution-driven back-casting approach is used.

## PARTICIPATION

Participatory design is defined as researchers and people at stake working together to define project goals and design new technologies, attending to implications for new ways of working (Blomberg, 1999). Participation is proposed as both a mean and as an end; as a mean to achieve, maintain or develop a purpose (e.g. Sashkin), or as an ideological manifest to achieve a democratic, progressive, and humanistic approach (e.g. Ehn). Already mentioned is the idea that participation better ensures a satisfactory outcome of the process. Additionally, participation is in itself claimed to increase the chance of successful implementation, regarding both productivity and job satisfaction (e.g. Vink et al.).

However, participation is also said to engage people in reflecting on their own knowledge, their understandings, skills and values, as well as the ways they interpret themselves and their actions (Kemmis & McTaggart, 2000). Since there is no particular context or practice to change in this project, this is what we emphasize.

## METHOD

As previously mentioned, we draw on a human-centered approach, involving an understanding of the world as not true, fixed or stable, but instead socially constructed in collaboration with others, as suggested by inter alia Krippendorff (2006). As a basis for the project, we therefore performed a comprehensive survey of Swedish manufacturing industries including collaborative inquiries within the *research* team. The inquiries within the research team help us understand the issues we are dealing with, the stakeholders we are concerned with, as well as help us discover possibilities through communicating different perspectives on the issues in an interdisciplinary group.

We are especially dedicated to highlighting and developing gender awareness in the social and organizational design, which is why our *design* team consists entirely of women. However, in the beginning of the project we performed activities with young people, trade unions, industrial employers and employees in various companies to explore meaning and context with them. In total, about 140 people have participated so far in the project (see the contribution of Johansson & Wikberg Nilsson to this conference).

These initial activities became the basis for developing a number of personas (see Wikberg Nilsson, Fältholm & Abrahamsson, 2009). Personas are fictive characters used to describe and communicate stakeholders to others (Cooper, 1999). The aim of using personas is to overcome difficulties in communicating and understanding meaning and needs. We have also found inspiration in the Critical Incident Technique (CIT), as proposed by Flanagan (1954). The main method, though, has been participatory workshops, with the design team, supported by techniques as personas, scenarios, and CIT.

## PARTICIPATORY WORKSHOPS

In the project, rather than workplace actions, we explore the participants' knowledge through participatory workshops. Such workshops are proposed to support co-operative learning and understanding of what meaning is to the participants (Westerlund).

In the approach to our workshops we draw on inspiration from the Future Workshop technique as introduced by Jungk (1989). The aim of such a workshop is suggested to support participants in a change process to reflect on the past and present, future possibilities and visions, and plan for action. The future workshop approach is facilitated by specific rules of communication, claimed to create a dialogue on equal terms (*ibid.*). The proposed structure consists of three phases of reflection on the present in 1) *the critique phase*, creating visions of the future in 2) *the utopia phase*, and finally the discussion of how to move from the present to the desired future in 3) *the implementation phase*. Such workshops are described to nurture shared understanding, compromises and shared commitment (Muller, 2003).

Furthermore, the proposition is that the setting of a workshop ideally should promote each actor to evolve as a function of other actors' behaviors in order for a synergetic interaction to occur (Latour, 1996).

An important aspect of a workshop is of course the participants. Westerlund demonstrates that participants that act only as representatives for stakeholders do not commit to the issue. For that reason, the suggestion is that the participants *should have personal experience and knowledge that they contribute within the workshop and thereby participate in the proposals* (p. 73). In our activities, this has meant that each participant represents her/his own point of view, in contrast to representing "all engineers", or their organizations perspectives, or something else.

We have held most of our workshops in our DesignLab, where there is material and space for a lot of people. So far, we have carried out four workshops with the design team, varying between eight and seventeen participants at a time.

It is alleged that the discussions during a workshop should not be understood as represented in language, but instead constituted *through* the dialogue (Westerlund). From our understanding this means to carefully explore the dialogues in terms of meaning, both with the participants and within the research team after each activity.

## DISCUSSION

In this paper we have presented parts of our methodological approach, its background, and incentives. In this final discussion, we take up a few of the aspects of a future factory we believe this approach have contributed to. As mentioned, our task in the project is to design a proposal for a future factory that includes preferences and needs of both women and men. For that reason we involved different stakeholders in the pre-study and introduced this initial mapping of needs to the Co-design team of women for further development. It is however important to note, that the aim of the project, and thereby its solutions, were never intended to be solely directed at women. Instead the aim of the design team of women is to include their ideas and visions into a further discussion of design of industrial organizations.

In our activities, we have aimed at *encompassing multiple values*, introduced as concepts of attractive and efficient factories, and explored what these might consist of; i.e. what is an attractive workplace, and what is needed to make an attractive workplace also competitive and effective.

*The collaborative approach* of this project has turned out as also part of the solution proposed for a future factory. Thus, there should be a broad participation of all stakeholders that might contribute to the process of change. *Gender awareness* in recruitment, workplace culture, group interactions and participation is something we jointly emphasize as well. Several of our participants have told us about incidents when they felt discriminated on the basis of their gender. Moreover, we see the synergetic effects of addressing all resources simultaneously; people and technology as well as business and strategic values. Based on our understanding, if the participants find the process meaningful, they are more likely to adapt and agree

upon the outcome of the process. Additionally, we find the inquiry into the future, as a *positive proactive approach* that we would like to propose as a solution for the future factory's management as well.

Nevertheless, we also see a need of *continuous learning*, including *learning to participate*, because many of our stakeholders have not been accustomed to such processes. Based on our inquiries, our participants have found it difficult to address all needs at the same time. However, this may also be due to the project task being "conceptual", and thus not having any real context to change or improve.

Furthermore, a design of a future factory should consider the incentives for people to work there, and their needs and preferences for *confirmation, diversity, control of work tasks* and *participation in change processes*. We understand incentives to be different for different people, so diversity should be given space and be affirmed. Furthermore, our participants have recognized that atmosphere and how people interact with each other are of great importance. Thus, we propose for a future factory to embrace a *positive workplace culture*, also recognized within management literature as a driving force for development.

## **FUTURE WORK**

In the project, there are still some activities to be completed, including finalizing a model, which is intended to address all aspects found as a proposal for a future factory. Our intention is then to use this model as a basis for further discussion with our stakeholders about future industrial organizations. The Future Factory project will not have a direct impact on Swedish manufacturing industry, but we hope to contribute to a resumed discussion on future management and work organizations and a growing recognition of the need to consider multiple perspectives in the development and design of the same.

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## *Paper 2*



## **Reframing practice through the use of Personas**

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The focus of this paper is a development process of ‘Personas’; fictitious characters are used to reflect on norms and perspectives of practice. Although reflective practice is a well-known process to enhance and support learning, improvement, development, etc., it is not easy to implement. Drawing on theories of action, this paper describes learning gained through using the Persona method within a research project called the Future Factory. The process of developing a Persona includes a reflective examination of the case approached and an analysis and Persona creation development that go hand-in-hand. Lessons learned are that the process of creating Personas has contributed to a critical reflection of investigation contexts and that both the technique itself and the process of creating Personas has contributed to re-framing practice among participants in the Future Factory project.

**Keywords:** personas; reflective practice; reframing; future factory

### **Introduction**

The focus of this paper is the use of a qualitative method, Personas, for re-framing norms and perspectives within industrial practices and for sharing knowledge and understanding amongst participants involved in joint activities. The reason for our interest in, and hence use of, Personas is an on-going three-year research project, called the Future Factory. The aim of the project is to design a conceptual future factory together with participating stakeholders.

Swedish manufacturing industry is heavily male dominated and it is argued that young Swedish people opt out of industrial work (e.g. Lindgren, 2005; Ziebertz & Kay, 2005). For that reason, our particular focus is to design a concept of a future factory based on the preferences and needs of women and young people. The inspiration for our project comes from Volvo’s YCC project; a concept car developed by a team of women. The aim of the YCC project was to include women, not exclude men, and was reflected in external and internal project goals such as reaching new customer groups (women), and by being a progressive company by promoting women to top management positions (Backman & Börjesson, 2006).

Our idea in the Future Factory project has the same basic goals; to our knowledge, a plant has never been developed by women only and we consider it worthwhile to test and see what comes out of the project. This is also the reason why we do not have a particular organisation or workplace in focus; instead, it is our process and our future

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outcome we consider important to discuss and draw attention to. Given this frame of reference, our initial intention has been to learn, understand and spread perspectives of industrial practices between our participants.

However, it is argued that design processes experience difficulties in exchanging needs and perspectives between people directly involved in the process and other stakeholders (Nielsen, 2004). For this reason, Cooper (1999) introduced the term 'Persona' for a fictitious description of a character that is used to initiate a discussion of norms, perspectives and interpretations of situations or practices.

Our intention in this paper is to describe our approach towards the Persona design process and what we have learned regarding its usefulness for re-framing practices. The paper commences with a brief introduction of both the project in which the Persona method is used and of our qualitative research approach. Thereafter, we discuss our understandings of, and approach to, the activity of reflective practices. This is followed by a description of the proceeding towards our Personas and what we have learned by using the method in the Future Factory project. The paper concludes with a reflection on what we have learned by using Personas in a participatory design of a future factory and what further actions we plan to initiate based on our learning.

### **The Future Factory project**

To provide a background for our interest in Personas, there is a brief introduction of the Future Factory project. The main purpose of this project is to explore new approaches to organisational development and production design as well as to develop theories of organisational design in an industrial context. The practical aspect of the project is to explore the possibility of designing a sustainable and efficient concept of a factory.

The project is carried out by an interdisciplinary research group consisting of seven researchers representing expertise in the areas of production systems, systems design, gender, organisational design, ergonomics and industrial design. The approach of the project is based on our notion that organisational developmental work must be continuously upgraded as the social context and the conditions of production change. For that reason, we have an interest in organisational development at industrial workplaces; how change is managed and who are involved in the process.

There are arguments for Swedish managers advocating aspects such as meritocracy, autonomy and anti-hierarchical leadership (Isaksson, 2008). In this project, we have an interest in highlighting these, we argue, positive aspects of Swedish management in order to reflect on the possible contribution of these aspects to a concept of a factory where everyone who has a stake is allowed to participate on equal terms. For the same reason we have an interest in methods that enable and support change at workplaces and based on these factors hence propose the Persona method. The Future Factory is a triennial project, expected to be completed by the end of 2010, performed in three phases: (1) a knowledge overview and mapping of relevant areas (such as *inter alia* contemporary manufacturing industry, new trends within production systems, organisational design and change management etc.); (2) an exploratory study of social and organisational aspects together with interest groups (such as young people, trade unions, industrial employers and employees); and (3) design work in collaboration with a design team consisting of women production engineers, systems designers, human resource managers, CEO's, industrial designers, architects, students and researchers.

We have a qualitative research approach in this project. It is argued that qualitative research projects easily comprise a large amount of data, which may be difficult to understand and analyse in the short term (Miles & Huberman, 1994). Methods similar to those of Personas and Scenarios are therefore used for compiling and presenting a large amount of empirical data in compact form, e.g. 'user profiles' are used to describe informants' experiences (Holzblatt & Beyer, 1993) and 'vignettes' are used to describe events taken to be representative, typical, or emblematic in the case approached (Miles & Huberman, 1994). We argue for Personas being a qualitative method for the reason of its proposed dealing with understanding social aspects of the enquired contexts, since qualitative methods are regarded to deal with matters of knowing and understanding (Denzin & Lincoln, 2000).

### **Reflective practice**

Design as such is argued to be a social process, involving communication, negotiation and compromises (Habraken & Gross, 1987). For us this necessitates an understanding of the world as a social establishment, in which we talk and share understandings in some kind of agreement. Given this, we have an interest in facilitating reflection on current norms and perspectives in order to ensure sustainable change, a process to change often referred to as a reflective mindset (Schön, 1995).

To give a simple explanation of what we suggest by changing perspectives through a reflective mindset we propose a simple exercise. There are many pictures in circulation that enclose two images within one, e.g. pictures that contain both an image of a duck and a rabbit, a young girl and a more mature woman etc. If presented with such a picture, we suggest that it takes a little extra work to change approach and be able to see the aspect not noticed at the first glance. If simply shown a picture, a person normally does not reflect on the presence of other aspects within; however, when it is pointed out that there is more to the picture than what was first seen, a person usually examines the content of the picture more carefully. If then able to see the aspect that is hidden within, a person has probably been forcing his/herself to see through a new perspective, a somewhat changed mindset towards the image itself.

It has been argued that being involved in discussions concerning interpretations of situations and practices contributes to changed mindsets, that it is a process that supports and enhances learning, improvements and development that is referred to as reflection-on-action (Schön, 1995). Therefore, such a simple exercise as the one presented above will possibly offer a small hint of what the Persona method may contribute to, what we propose as changed mindsets of people involved in reflections on interpretations of situations.

Previously, members of the research team have, to various degrees, explored the Swedish manufacturing industry from diverse perspectives. However, in this case we felt it necessary to address previously noted concerns through a holistic approach together with stakeholders. Put differently, we wanted to make our contribution to a reflective practice within Swedish manufacturing industry.

The activity of forming a reflective practice, although not a new idea has been an inspiration for us in our aim for a reflection on norms and perspectives in the case approached. Schön has contributed to an awareness of the activity of reflection and also coined the term 'reflective practitioner'; however, reflection was first acknowledged by Dewey's (1998) examination of 'reflective thinking'. According to Dewey,

reflective thinking is the kind of thinking that consists 'in turning a subject over in the mind and giving it serious and consecutive consideration' (p. 3). Furthermore, Dewey argued that reflection implies that a practice exists, that there is a prevailing norm to reflect upon. However, it is also argued that concerns that are defined by a community of practice may have difficulty in escaping established ways of thinking or even of raising critical voices concerning what is addressed (Argyris, 1991). A consequence of this, Argyris emphasises, may be a reinforcement of existing norms and perspectives without substantial reflection.

This attracted our attention, as our objective is to initiate a discussion on existing norms and perspectives, and furthermore challenge them, possibly, with support of the Persona method. Given this, we considered the possibility of utilising Argyris and Schön's (1978) theories of action that are understood to address the difficulty of realising sustainable change in practice. First, Argyris and Schön pose the theory-in-use, which, they argue, governs actual behaviour and tacit knowledge and structures. Second is the espoused theory, suggested to be the way we present ourselves and our actions, the way we would like others to think we act. However, Argyris and Schön state that the theory that actually governs our actions is the theory-in-use. According to this, substantial reflection may not occur if all participants express their espoused theory of action instead of their actual theory-in-use. Thus, as Argyris and Schön argue, a key role of reflection is to bring to a person's mind their theory-in-use.

Thus our next concern became how we could evoke theory-in-use. Based on the above-mentioned reasons, we realised that in surveys and interviews respondents probably present their espoused theory of action. However, we concluded that through addressing their background, personal traits, understanding and knowledge of the organisation in combination with participatory observations, we might both conjure theories-in-use and espoused theories of action. Furthermore, Argyris and Schön's experiences in organisational development strengthened our confidence in Personas as a method to bring to mind theory-in-use through dialogues within a practice.

Argyris argues that when norms and perspectives are taken for granted, reflection is often directed towards more efficient strategies. Consequently, he states, efficiency and learning are thought of as matters of motivation; when people have the right attitudes and commitment, learning, and thus continuous improvement will follow automatically. Given this assumption, he argues, the strategy is often to create new organisational structures including compensation programmes, performance reviews, corporate cultures, and such like. However, he stresses, it is not simply a matter of how people feel, it is rather a matter of how they think; defined as the rules and norms they use to implement their actions. Put differently, reflective practice is additionally a creative activity that is neither about thinking more, nor thinking harder, rather, it concerns thinking differently (Ghaye, 2007).

With this in mind, our objective has been to understand, learn and bring to mind how people think as well as the rules and norms that governs people's actions. This can be called a frame of underlying values, intentions and experiences (Ghaye, 2007). Re-framing is for this purpose to think of other ways of doing or understanding things, to 'put on another pair of glasses' and reflect on practices through them. Since our project aim is to design a conceptual future factory that embraces diversity and contributes to human flourishing, we argue for the need of a re-framing of practices.

### **Our approach to Personas**

Thus, once we had gained an understanding of the need to re-frame practices in order to design a concept of a future factory that is both effective and attractive for all concerned, we searched for the means to accomplish this. Within the field of design, Personas is a frequently used method to focus a design process towards a specific user on the market. Since one of the authors has previous experience from the design field, we wanted to test the Persona method's applicability in this case as well. However, in this case we were dealing with a complicated situation that involved human, technological and organisational aspects, and that involved both the design of workplaces and working conditions. Nevertheless, we wanted to test if Personas were valuable for re-framing practices.

### ***Personas***

A Persona is a fictional description of a person, whose characteristics are of importance for the project it is designed for. The use of Personas is said to be a human behaviour, based on the presumption that we humans from our very early years try to make interpretations, connections, predictions and expectations concerning other people in our environment (Grudin & Pruitt, 2002). Given our previously mentioned interest in re-framing practices within Swedish manufacturing industry, we were interested in the method's suitability for our purposes.

However, some claim that a Persona development process is not a simple and straightforward process; therefore, Grudin & Pruitt (2003) stress a basis in data and communication of the Personas as vital aspects. There is not an unambiguous way of developing a Persona, but descriptions share some common similarities, which we have illustrated in a cyclic stepwise approach presented in Figure 1.

### ***Persona creation***

The focus in this paper is our process of creating Personas, a process that has included critical reflection of Swedish manufacturing industry and an analysis and Persona creation that have gone hand-in-hand. Our initial aim was to learn and understand the context, create Personas based on that learning and afterwards use the Personas as tools in the design process with our design team. This could be called a linear process. However, we did not initially appreciate the potential of the Persona creation process. Put differently, it has turned out to be a continuous development process, which started in 2008 and that will probably continue until the end of the project in 2010, since we are still learning. Thus, our process has turned out a cyclic stepwise approach, as presented in Figure 1.

Our initial step with the Persona creation was to form an understanding of the context and the people involved, what is referred to as mapping and contextualising in Figure 1. For that reason, we contacted human resource managers at several Swedish manufacturing organisations to ask if they would be interested in co-operating in the project by allowing us access to respondents. We managed to gain access to employees in six different organisations, and hence obtained eight individual interviews with women shop-floor workers, one focus-group interview with seven women participants (both production engineers and shop-floor workers), and one focus-group interview combined with participatory observations with three women participants (production engineers). In addition, we had empirical material that we considered

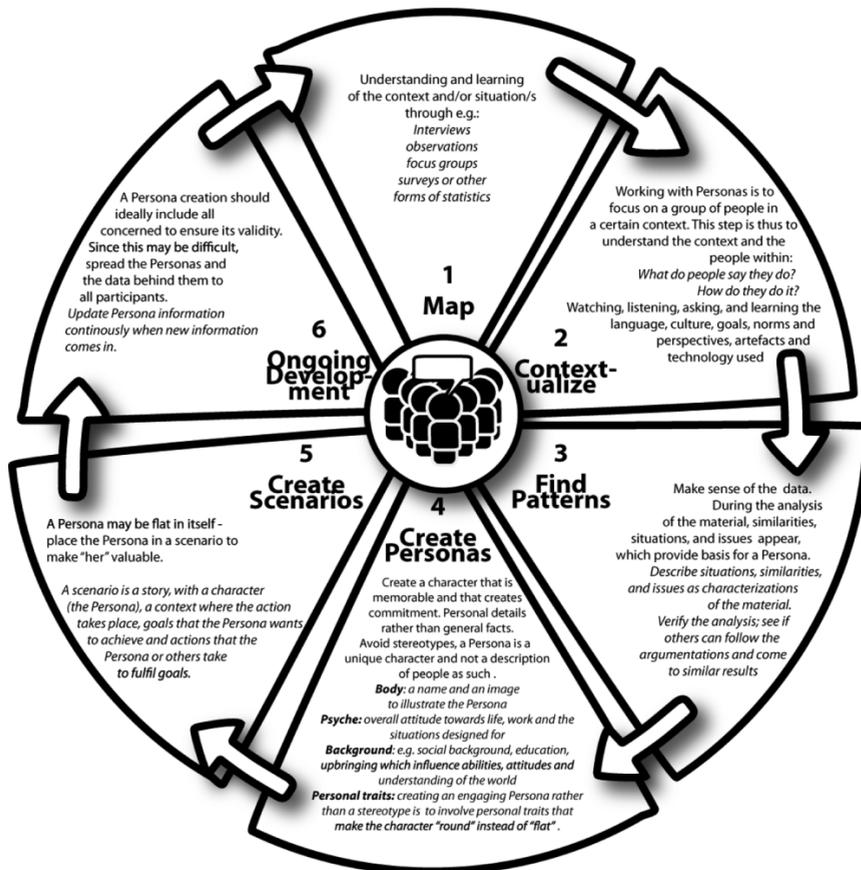


Figure 1. A cyclic step-wise approach to Persona development, inspired by the work of Cooper (1999), Grudin & Pruitt (2002, 2003), Nielsen (2004, 2007), and Pruitt & Adlin (2006). Source: Illustration by Åsa Wikberg Nilsson.

valid from a similar case study performed by one of the authors within the Swedish manufacturing industry (see Abrahamsson, 2009).

As mentioned in the introduction, the second project phase consisted of forming interest groups, with the intention of reflecting on practice from various perspectives. Early in the project we thus held a workshop with a network of work environment specialists from various trade unions: seven men and one woman were participants. Thereafter, we contacted a secondary school class and asked if they would be interested in sharing values and perspectives of the future with us; 23 young people, (17–18 years of age, both male and female) participated in this workshop. In addition, we managed to gain access to a network of manufacturing industries' CEO's, who agreed to discuss management trends and attractive workplaces of the future; 17 people (eleven men, four women and two of us) participated in this activity.

After these early activities, we contacted women working within Swedish manufacturing industry and asked if they would be interested in participating in a design

team with the aim of developing a concept of a future factory. We contacted 16 women and 14 were willing to participate in the project. Thus we had a design team consisting of women production engineers, systems designers, human resource managers, CEO's, industrial designers, architects, students and researchers. The main work with future vision has been in workshops with this group. During the workshops with our design team we video-filmed the activities in order to be able to listen to the discussions afterwards, as a complement to our field notes. After each activity we discussed our material and analysed it in collaboration. All of these activities have served multiple purposes: to serve as a focus for understanding and learning about the context of Swedish manufacturing industry; to serve as a foundation and validation for our Persona creation; and to share perspectives of practice between the participants.

However, the main basis for our Personas was the interviews, as through the other activities we gained an understanding of the context and hence what the focus of our characterisations should be. Our investigation aimed to map Swedish manufacturing industry as a whole, not a particular practice. Consequently, our interview respondents came from different organisations and thus had different understandings of practice to share with us. All these activities began with us describing the Future Factory project and our question of whether they wanted to contribute to this project. The interview questions focused on particular features of the respondent's work tasks and worksites as well as on broader issues relating to attitudes and individual development. Our tasks included watching, asking and learning about our respondent's situations. The following reflective questions indicate our interests:

- Knowledge and skills: What is your background? What education do you have? What would I have to learn to be able to do your job?
- Worksite: Tell me of your workplace, attitudes, norms, behaviours etc.
- Work tasks and responsibilities: Tell me of a workday, what do you do and how do you do it?
- Organisation and business strategy: Describe your organisation, what is it that you do? Who is responsible for what in your organisation?
- Change processes: If there is a plan for change at your workplace, how does it happen? Who is involved?
- Personal traits: Tell me a bit about yourself, what is important for you in your life?

The respondents provided us with knowledge and insights concerning their individual situation and setting. However, because we chose not to have a particular workplace, we had to deal with broader issues concerning organisation, strategies and individual development rather than specific technology for tasks etc. The next step in our Persona creation consisted of finding emerging patterns in the data. We discussed and analysed the data within our research team and agreed on three emerging patterns in the material, matters of concern identified during the initial steps. We learned that when approaching the situation of women and young people in industry, we encountered problem situations. The following example is indicative:

I have had to fight to get further training: you have no idea how much. My manager wanted me to get this job, he thinks I am dedicated and talented, both theoretically and practically, but the others said that no woman has done this before, so they didn't want me there. Actually I had to swap shift team to get this training and hence qualification for the new work tasks. I have thought a lot about this, why didn't they want me for that



**Summary**  
Meet Anna, a young woman of 22 years. She has worked for 1,5 years on a new assembly line. It is a stressful and hard job that she has difficulty coping with. Her attitude towards this job is that it gives money and has good co-workers. Though Anna's personal aim is to travel around the world and experience things, she wants to do something good for humanity.

**Rationale for Anna**  
The characterization of Anna deals with young people not interested in industrial work, their desires to do something of value and to see and experience things. Our matter of interest was how we can attract young people and design job situations that are valuable for them.

Figure 2. Summary of information of Persona Anna and the rationale for this Persona. Source: Photograph by Anders Berglund.

job, they knew I could do it? I think they felt challenged by a woman being able to do the same thing they do. I am so naïve, thinking they would consider it good to get a person committed to do a good job! [laugh] (Quote from interview 19 November 2008, author's translation)

As a result, we sought to create characters that contribute to substantial reflection about practices, to spread an understanding of the different situations of people within Swedish industry. Our idea is that Personas can be discussed by all participants in an activity and thereby contribute to discussions without identifying or singling out a specific individual in the group. Thus, we began to create engaging Personas of our three characters; Anna, Eva and Dan: see Figures 2–4.



**Summary**  
Meet Eva, a middle-aged woman working with assembly work. At her firm a re-organisation aimed at work rotation and flatter hierarchies failed, and resulted in no major change. All women within the company are still doing the assembly work and the male workforce are doing other things. Eva is on sick leave at half time for a work-related injury and would like to do more than assembly work. She really looked forward to the re-organisation and is quite disappointed by it not being implemented.

**Rationale for Eva**  
Persona Eva addresses the issue of some enterprises having a workforce segregated in terms of gender, women performing certain work task and men doing others, and the difficulty of changing practice without seeing, asking, watching, learning and substantially reflecting on norms and perspectives that are taken for granted. We were interested in discussing gendered work situations and organisational development work with our participants, that was the reason for Persona Eva.

Figure 3. Summary of information for Persona Eva and the rationale for this Persona. Source: Photograph by Anders Berglund.

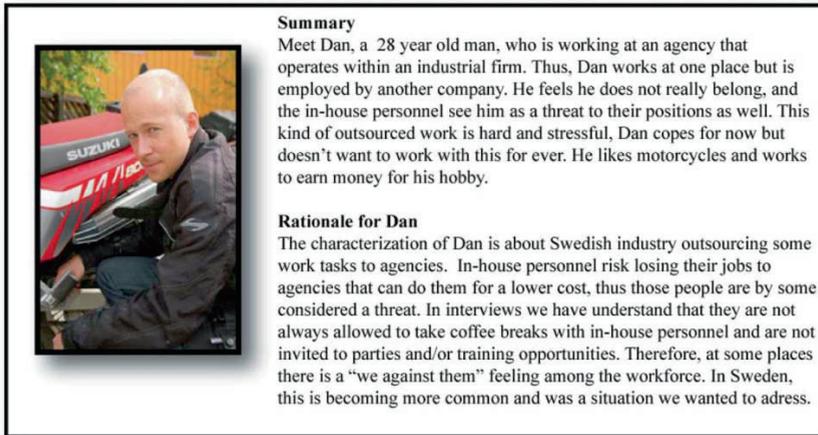


Figure 4. Summary of Persona Dan and the rationale for this Persona.  
Source: Photograph by Anders Berglund.

Each character had their own short narrative and we used friends and colleagues as models for the Persona photos. A reflection from our use of Personas is that they tend to be flat if simply presented on a piece of paper. We therefore emphasise that they should be accompanied by a dialogue led by a person familiar with the data behind the Persona, who can liven-up the story with further details. Based on our understanding, photographs add 'reality' to the character, for that reason an image is important. When this step in our persona creation process was achieved, we wanted a confirmation of our Persona's validity, and for that reason involved some of our stakeholders in our Persona creation.

### ***Persona validation***

During the early phases of this project we understood the necessity of interacting with stakeholders in activities to validate our understandings of the practice, so the same applied for the Persona validation. The first emerging opportunity was a workshop with participants from trade unions. They confirmed our Personas as being plausible people working within the Swedish manufacturing industry. Another aspect that we believe strengthens the validation of our Personas is the participant's claim of already being aware of the situations that Anna, Eva and Dan personified. Even so, we argue that the discussion that followed the presentation reflected our Personas' situations. The participants discussed the trade union's ability to influence and change the practice from the perspectives of the Personas situation; the following examples exemplify some of the visions that those participants consider would add value for Anna, Eva and Dan:

- A vision of having work-teams who work with the whole product process instead of specialised work at assembly lines.
- A vision of having networks of competences and business that plan and perform work together instead of the 'we and them' feeling that agency employed people sometimes experience.

- A vision of being able to learn and continuously develop during working life.
- A vision of automating processes which are monotonous and stressful, to prevent occupational injuries.

We see a resemblance between the participants' visions presented above and their origins in our Personas, and for that reason believe our Personas have contributed to a reflection on practice. The participants in this workshop already had a critical perspective of practice, and our Personas cannot take all the credit for having contributed to that. Nevertheless, we see the participants as having given legitimacy to our Personas.

After this workshop our Personas have been reflected upon in several activities with industrial employers and employees. Here we choose to present quotations from one workshop with our design team. The activity began with us describing our Persona creation process and we thereafter presented Anna, Eva and Dan. The following quotations illustrate a summary of the dialogue:<sup>1</sup>

- Comment 1: I think it has to do with work culture and management styles. Some managers have trouble with confronting their former colleagues. The situations that Dan, Anna and Eva illustrate are not acceptable; it should not be like this.
- Comment 2: We have to address group behaviour, that people are fostered into certain behaviour and norms.
- Comment 3: I think it's important to be able to see a future within the company, to have different role models and to know that you can develop within the company, to get challenges and further training and education, for example.
- Comment 4: Work must be creative and stimulating, not boring and monotonous.
- Comment 5: Education and team activities can and must deal with norms and perspectives. Managers must be able to address those issues.
- Comment 6: There is a lot of talk about customer focus, but not so much about co-worker focus. There should be a balance between focus on value for the customer and value for the co-worker, which would give more value to the actual outcome of the process, the product, in the end.
- Comment 7: Participation in developmental processes, understanding of business strategies and processes as well.
- Comment 8: A vision could be to work in projects instead of ordinary tasks, for example, to work with continuous improvements within one's area or to work in networks with a specific project. Wouldn't that be something?
- Comment 9: I think it is important to feel that I am able to influence my own situation, to feel that I am in control.
- Comment 10: A vision of flexible co-workers, technology and premises ... but there must also be recognition of one's efforts, a challenge in the work task and respect between the individuals.
- Comment 11: When hiring there could be a profile, perhaps like the Personas, which consist not only of what the person should do at work but also about Personal traits that would contribute to a great multi-competent team.

Comment 12: And by that adding people with different competences and perspectives in order to change the practice. (Quotes from workshop 21 September 2009, author's translation)

The dialogue above illustrates the parts that we understand particularly deal with our Personas and that may provide the reader with an indication of the dialogue. An ethical issue of presenting 'voices of other's' is that we may interpret the discussion differently than the participants would have. For that reason we have used the opening of subsequent workshops to present our understanding of the previous one and to have a reflective discussion. However, this has only been possible with the design team. Here, we chose to present these comments since we consider them to indicate how concerns, here presented as Personas, can be used for critical reflections that lead into visions of a desired future. Our understanding is that the Personas focused the discussions on the Personas' situations and that the participants' visions had a base in their concerns. From that perspective, we argue, the Personas have contributed to a reflective practice.

### **Reflections on what we have learned**

In our initial examination of the context of Swedish manufacturing industry, we learned that change processes do not always work as planned, and that the average worker does not understand, or know of, their company's business values and goals. This is in contrast to the proposed Swedish management style (Isaksson, 2008), and thus something we have an interest to further reflect upon with our project participants.

Based on our investigation, we understood some theories of action that may explain why change processes do not always work. For example, the material that led to Persona Eva illustrates a work organisation that did not manage to perform a planned reorganisation due to, as we understand it, a lack of awareness of norms that existed within the organisation. At this particular company women did monotonous assembly work and were hence victims of occupational injuries, while men did repair work and thus were able to move around the workplace more freely. Here, the proposed change consisted of rotated work tasks; however, the male work force refused. Our line of reasoning is hence that theory-in-action was not substantially reflected upon. Another aspect indicated within the interviews was that of outsourced jobs to agencies. We believe that comments like 'they take our jobs' or 'we did not ask them to the Christmas party' illustrate a division of the workforce. Our understanding is that this does not contribute to a successful practice. However, our interest has not been to report problems and criticise current practice. The Future Factory project is about developing a vision of what might be in a future factory, a vision of a reflective practice.

Nevertheless, fostering reflective practice is claimed to require more than telling people to reflect and then hope for the best (Russell, 2005). In the introduction to this paper, we proposed the use of Personas as a practical method for re-framing perspectives. Within the research team we have found the Persona creation process very valuable, we have gained understanding and knowledge we did not previously have. We therefore consider ourselves as verification of re-framed perspectives of practice. Even so, we expected more than our own re-framed perspectives; we aimed for substantial reflection among our participants as well. The following paragraphs describe what we have learned from using Personas within the project.

***What we have learned from the first activities***

The participants from trade unions taught us that there are on-going critical reflections within Swedish trade unions, and that they were already aware of the concern presented as our Personas. However, they claimed to not have the power to actually influence practice within the Swedish manufacturing industry. Nevertheless, they found the Future Factory project interesting and we have had follow-up activities with them. From interacting with our stakeholders in activities, we have learned that the Personas are valuable for starting a discussion and that it seems to be easier to talk about, for example, Dan, than to talk about general concerns. Another lesson learned is the commitment that seems to emerge, when presented with ‘people’, even though they are fictitious ones. We have had participants taking part in serious debates about, for example, Anna’s concern; ‘But what about Anna, have you thought about her?’ is a comment that we believe illustrates this.

***What we have learned from engaging with our design team***

The main work with the design of a concept of a future factory has been, and still is, with our participants in the design team. The aim with the design team is to create visions of a desired future; an ideal work-organisation where both people and processes continuously develop, improve and flourish, a future factory that is both effective and attractive. However, some participants have commented on our aims; ‘we should not develop only “soft values” just because we are women’, is, we believe, a comment that indicates the difficulty of having a group of women singled out for the purpose of being women, even if they are valid representatives of Swedish manufacturing industry as well. In the Future Factory project we do not deal with gender issues – we have chosen a women design team based on gender equality; women being in a minority within Swedish manufacturing industry necessitates a majority in the design team.

Another lesson learned is that it is not easy to take on a project that does not deal with a particular practice. When not able to discuss a particular practice it is difficult to build future visions that every participant can agree on. However, the Personas have provided support for concerns that all have been able to agree upon. They have shown the possibility of being a valuable start for reflections, and ‘somebody’ to focus outcomes on. The Persona narratives are in constant development since we learn something from our participants that relates to each character. As mentioned, we found the Persona development process valuable for our own reflection on practice. Consequently we plan to let our participants develop their own Personas in upcoming workshops. A true benefit in this project has been to have participants committed to the issue of developing a concept of a future factory based on a human perspective and not a solely technological one.

**Reflections on the Future Factory**

In the project, there are still some activities to be completed, including finalising a model, which is intended to address all aspects found as a proposal for a future factory. Our intention is subsequently to use this model for further reflections with our stakeholders. Yet another lesson learned is the need for a re-framing of our approach – from critical reflections towards appreciative reflections. Our aim is that the model of a future factory will build on today’s strengths, packed in a ‘future shell’.

The Future Factory project will not have a direct impact on the Swedish manufacturing industry, but we hope to contribute to a resumed discussion on future management and work organisations and a growing recognition of a need to re-frame practice in the development and design of the same. Whatever our final design solution, our aim is that it will contribute to change; not only how people are doing their tasks and how organisations operate in the future, but also that it will contribute to re-framed mindsets of our project participants as well.

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### Note

1. In total we have several hours of video material; here we present a small part of that. We use the word 'summary' since it is difficult to transcribe a video-filmed dialogue exactly as it is spoken and since the discussion in total would take up too much space

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## *Paper 3*



# The Future Gap: Exploring a Critical Reflective Stakeholder Approach

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## Abstract

The focus of this paper is a participatory design process that is used as a means to enable multiple stakeholders' collaboration in discussing strategies, designs and solutions of a conceptual future factory. The reason for this study is the Swedish industrial sector's difficulty in attracting women and young people. The design process can adapt to various complexities, building on the creative and innovative ability of collaborating people. In the present study, young people participated in explorations of images and perceptions of the current industrial sector and in an inquiry into the needs and preferences of a future factory. This activity resulted in two future scenarios: utopia, a positive future vision, and dystopia, a pessimistic outlook. These scenarios subsequently were used as means for critical reflection with multiple industrial sector stakeholders, exploring the future gap as the discrepancy between the images, perceptions and understanding held by internal stakeholders compared to external stakeholders. In this paper, we propose scenario-based design as one approach to multi-stakeholder activities, both for understanding various stakeholder needs and preferences and for critical reflection on future strategies and visions with a diversity of stakeholders. We believe there is a need for a transformation in the way in which organizations involve and connect to stakeholders.

**Keywords:** Multi-stakeholder approach, Participatory design, Corporate social responsibility, Future scenarios, Critical reflections

## 1. Introduction

This paper aims to explore a multiple-stakeholder approach to organisational development. This approach is used in a Participatory Design (PD) research project involving a diversity of stakeholders who participate in critical reflections on an entire industrial sector and, subsequently, in the design of a conceptual future factory. The motivation for this project is the difficulty that the Swedish manufacturing sector has faced in attracting women and young people as employees. The exploration of this problem was the point of departure for the interdisciplinary research project called 'the Future Factory'. In this project, a group of young people were invited to explore visions of the future; participants were asked questions such as what they would like the manufacturing sector to be like for them to consider it a future workplace. This study resulted in two future scenarios that subsequently were used as means to stimulate dialogue with industrial sector stakeholders. Therefore, in this paper, scenarios are explored as means for multi-stakeholder dialogue. The idea is that scenarios both can communicate various stakeholder needs and preferences and can be used for critical reflection on strategies, design and development in collaboration with multiple stakeholders. There is a lack of research addressing critical multi-stakeholder perspectives in relation to organizational design. Drawing from Miles et al.'s (2006) description of the 'the future gap' as the difference between the future visions held by corporate managers and those held by stakeholders, in this paper, we present an approach involving multiple stakeholders collaborating in workshop dialogues in order to minimize such gaps.

The Future Factory project approach draws inspiration from the field of design. In the last decade, a new design

discipline has emerged, building on traditional design skills to address complex social and economic issues (The Design Council, 2006). In our study, the design process has been used as a means to enable multiple stakeholders to collaborate and discuss strategies, designs and solutions for a conceptual future factory. The design process can adapt to various circumstances and complexities, building on the creative and innovative ability of collaborating people. With this project, our aim is to create a good design, with systems, spaces, interactions and experiences that not only satisfy a function or solve a problem but also satisfy symbolic dimensions for multiple stakeholders. We propose that there is a need for a transformation in the way in which organizations involve and connect to stakeholders.

One obvious sign of the need for new forms of interactions with stakeholders is the aforementioned fact that the manufacturing sector does not attract young people, despite higher wages than are present in many other sectors. In Sweden, young people seem to value factors other than high wages, e.g., social networks and activities that provide authenticity and satisfaction (Ziebertz et al., 2005; Lindgren et al., 2005). There is an argument that young people are not attracted to the manufacturing sector because of a perception of an instrumental focus on standardization and discipline (Gillberg, 2010). Although we see this as an obvious reason for a conscious and pro-active multi-stakeholder strategy, this understanding of the sector may be one explanation for young people to opt out of industrial work. For this reason, in a design approach to future challenges, in the Future Factory project we have included both internal and external stakeholders in explorations of future scenarios of the Swedish manufacturing sector.

### *1.1 The Future Factory Project*

'The Future Factory' is a three-year research project (2008-2010) performed by an interdisciplinary research team with expertise in the areas of production systems, systems design, gender, organizational design, ergonomics and industrial design. The reason for this project is the previously mentioned difficulty of the Swedish manufacturing sector in recruiting women and young people as employees. Despite gender mainstreaming efforts during the last decades, women still are in the minority within the Swedish manufacturing sector. Moreover, despite several campaigns to raise interest in industrial work and technology, young people still opt out of industrial work. For this reason, one way of increasing the sector's attractiveness may be to involve women and young people in dialogues regarding strategic planning, design and development of working environments and production systems. This pro-active approach is applied in the Future Factory project, which addresses the Swedish sector of manufacturing industry.

The practical aspect of the project is to explore the possibility of a collaborative design of an attractive, sustainable and efficient conceptual future factory. The project approach is based on the notion that organizational development must be continuously upgraded as the social context and conditions of production change. For that reason, our interest is in organizational workplace design and change management, i.e., how change is managed and who is involved in the process. For example, there is an argument for Swedish managers to advocate aspects such as meritocracy, autonomy and anti-hierarchical leadership (Isaksson, 2008). In the project, such positive aspects are explored, to reflect on the possible contribution of these aspects to a future factory where everyone who has a stake is allowed to participate on equal terms in meaningful dialogues on corporate strategies and activities. For the same reason, we have an interest in methods and concepts that support sustainable collaborative processes for change, with multiple stakeholders involved. The final phase of the project involves a team of women production engineers, systems designers, human resource managers, CEOs, industrial designers, architects, students and researchers in the design of the conceptual future factory (Wikberg Nilsson et al., 2010).

## **2. The Concept of Stakeholders**

Stakeholder theory, originally proposed by Freeman (1984), is a common frame of reference when discussing stakeholder activities, both in organisations and academic writings. The concept is connected to a tradition that sees business as an integral part of society rather than an institution separate and purely economic in nature (Freeman et al., 2005). In contrast to what is commonly believed, in the early history of modern industrial organisations, profit maximisation was not the absolute law of business; instead, organisations were expected to exist for the public good (Kochan et al., 2000).

The concept of stakeholder is not easily defined; it ranges from consideration of all people with an interest in the organisation as stakeholders to a more narrow view of those who have a specific contract binding them to that organisation. Donaldson et al. (1995), presenting the former view, define stakeholders as persons or groups that basically have an interest in some aspect of corporate activity. Therefore, they identify stakeholders by their interests in the corporation, regardless of whether the corporation has any interest in them. They further state that

the stakeholders' interests should be of intrinsic value, meaning that each group should be considered for their own sake and not to further the interest of other groups, such as shareowners. Post et al. (2002), presenting the latter perspective, define the stakeholders in a corporation as "the individuals and constituencies that contribute, either voluntarily or involuntarily, to its wealth-creating capacity and activities, and that are therefore its potential beneficiaries and/or risk bearers" (p.19). In this definition, the term stakeholder implies people who have a stake in the organisation, i.e., something to gain or lose. Hatch et al. (2003) further exemplify stakeholders not only as employees, customers, investors, suppliers, partners and regulators but also as people with special interests and local communities. Post et al. (2002) additionally include unions, supply chain associates, governments and alliances besides the former interest groups. Whereas, for example, employees are linked to the organisation through internal contracts, other external interests may be unaware of their implicit relationship with the corporation until something draws attention. Post et al. (2002) narrow the term stakeholder down to individuals who either have a stake in the firm – i.e., something to win or lose – or have certain power over the organisation or contribute valuable resources that are critical to the firm's success and that they may risk by their commitment. According to this definition, stakeholders are identified as people with a common interest in that the organisation is operated in such a way that it adds some kind of value for them. Kochan et al. (2000) see the reason for stakeholder involvement as being a search for "a better balance in the distribution of economic and social benefits and risks" (p.369).

In the present study, there is no organisation that can define its stakeholder; instead, we in this project have defined stakeholders as an entire industrial sector: the Swedish manufacturing industry. Prieto-Carron et al. (2006) argue for a critical research agenda establishing a genuine human-centred approach to stakeholders. They further stress a need for approaches based on participatory and collaborative methodologies, for investigating power structures both within organisations and within society. Hence, we have explored new approaches to an entire business sector's organisational development in this study, by including both internal and external stakeholders in workshop dialogues. We have defined the manufacturing sector's stakeholders as employees, managers, trade unions and industry associations. In addition to these stakeholder groups, we have specifically invited young people as future employees, managers or shareholders, and also as current stakeholders whose perceptions, ideas, thoughts and visions about the future of industrial work needs to be heard.

### *2.1 Corporate Social Responsibility*

The concept of corporate social responsibility (CSR) has a focus on involvement of stakeholders in corporate activities. CSR has been described as the buzzword of the millennium (Pedersen, 2006) because an increasing number of both scholars and practitioners are adopting a variety of approaches to the concept. CSR is defined as a concept concerning companies' incorporation of social and environmental considerations into their business operations, strategies and interactions with stakeholders (Commission of the European Communities, 2006). Thus, the concept of CSR implicates seeing the company as integrated with, rather than isolated from, society and the environment (Pedersen, 2006). But even if stakeholders' requests for social responsibility of organizations has dramatically increased over the past decade (Brønn et al., 2003), in our view, the Swedish industrial sector has not adjusted its operations accordingly by inviting a diversity of stakeholders into discussions of strategies, workplace design and work tasks.

Carroll (1999) refers to early writings on the subject as, e.g., Bowen's *Social Responsibility of the Businessman* in 1953 and McGuire's *Business and Society* in 1963. Both of these writings include, e.g., business' obligations to take interest in politics, the welfare of the community, education, developing 'good' workplaces and socially desirable lines of action, besides their economic and legal obligations (Carroll, 1999). In Europe, laws regulate some aspects of corporate social responsibilities. In 2004, the International Institute for Sustainable Development defined a proposition for an ISO standard concerning the concept of CSR as an organization's contribution to a balanced promotion of sustainable development in economic growth, social development and environmental protection (IISD, 2004).

The concept is also said to include activities ranging from purely altruistic, one-off events to long-term efforts addressing stakeholder expectations, ethical obligations, legal requirements and universal principles (IISD, 2004). The proposed standard definition, as set forth by IISD, does not make the picture of CSR any clearer. The difficulty in defining the concept is also recognized by Brønn et al. (2001), who assert that knowledge of CSR is diverse and often vague and that in both countries and companies people are uncertain of its relevance or application. Also, some CSR guidelines in policies expect a 'respect' for laws and regulations, for socio-cultural values, such as gender and minority relationships, for the role of the family and for an active commitment in cultural and political life (Brønn et al. 2001). Although recognizing the potential of such guidelines, we consider them to be too general and too vague to really have impact on business. There are no explanations in policy

regulations addressing the meaning of the often used CSR words 'respect' or 'ethics', what those words means in a company's day-to-day business and interactions with stakeholders. Likewise, there are no comprehensive analyses of why CSR is important for both society and corporations, who should be involved and how CSR activities should be managed. Post et al. (2002) assert that companies do not deserve to be in business if they do not act in accordance with the dominating norms, rules and values of a society. Despite agreeing that there is a need for some companies' socio-cultural adaption, we mean that, within CSR, there is an additional need for questioning the existing norms and practices. In accordance, Prieto-Carron et al. (2006) claim there is a need for a critical perspective on organizations' recognition of the roles of power, class and gender. Further contributing to the former argument is the claim that organizations are not being able to define their social responsibility on their own; therefore, some emphasize having active dialogues with other parts of society (IISD, 2004).

However, if carefully implemented and managed, we do believe that there is great potential within the concept of CSR. The recent stakeholder interest in the concept is, for example, said to be concerned with the environmental movement, sustainable development and organizational learning (Brønn et al., 2003). There are, however, arguments for various stakeholders having diverse views of these issues compared with corporations. Hence, some stress the need for understanding and undertaking multiple stakeholder relationships when dealing with business strategies and future visions (Brønn et al., 2003; Miles et al., 2006). Research studies in pro-active corporate social responsibility have, for example, been addressing corporations taking on responsibility for overproduction of goods and the consequent environmental impact (Manzini et al., 1992) or designing environmentally friendly products that also appeal to customers (Manzini et al., 1992; Shrivastava, 1995). Undertaking CSR activities is said to enhance brand reputation and image (Leonard et al., 2003). In short, engaging stakeholders in CSR activities is recognised as good business.

### 3. The Study

In the area of design, a human-centred perspective includes understanding the context, such as system's functions and structures, what stakeholders need, which preferences they have and what kind of interactions they are involved in (Holzblatt et al., 1993; Beyer et al., 1997). In the late 1960s, Participatory Design (PD) originated in worker collaborations in the design of workplaces and tasks (The Design Council, 2006). In Scandinavia, PD has a long tradition, as expressed in the Utopia project in the 1980s (e.g., Ehn, 1988; Bødker et al., 2000). Participatory Design means that the people who will use the resulting space participate in the design process, which opens up entirely new forms of cooperation and collaboration. Drawing inspiration from PD and stakeholder theory, we in this study propose scenario-based workshop dialogues as activities that can link various external and internal stakeholders together and create relationships that explore meaning, production and values both within and outside of an organisation. Communication is one way to develop, organise and disseminate knowledge (Duncan et al., 1998). A design approach includes investigating "how it ought to be" (Simon, 1996), in this case meaning ideas and visions of what the manufacturing sector ideally would be like.

In this study, the participants were 23 students in an upper secondary class, including 10 young men and 13 young women aged 17-18 years. The local context for these young people is the northern part of Sweden, in a city in which the major employer is a large process industry. Notably, the young people's impression of the manufacturing sector may be influenced by this industry. The participants were initially introduced to the project idea and our intention of using their future scenarios as means for dialogues with other project interest groups. All agreed to participate and agreed to our use of their scenarios. The workshop began with an open-ended discussion, inspired by the focus group methodology described as useful for creating interactive communication among a group of people (Kitzinger, 1994). A focus group approach is furthermore said to be useful for investigating values of a phenomenon (Ståhlbröst et al., 2006), in this case the young people's perception of the manufacturing sector and their visions of future work.

First, the participants were asked to individually select an image that in one way or another represented 'the future' for them. The images used during this event were both intangible visualisations, such as a sky or a beach, and images of tangible objects and environments, such as artefacts, people, technologies and contemporary production environments, drawing on the idea of stimulating their individual reflections of the future (Rehal et al., 2006). Thereafter, in groups of 3-4 people, the students were asked to discuss the meaning of the images. They were further encouraged to discuss characteristics of 'good' jobs, colleagues, tasks and premises as well as their perceptions of the manufacturing sector. The images themselves are not directly significant, based on the presumption that the images act as mediums for personal reflections of the subject discussed. After the discussions, the participants were asked to write an individual future scenario describing them working in a future factory. Carroll (1997) defines a scenario as a description of a meaningful episode. He further asserts that in design, scenarios can evaluate meaning through claims analysis, wherein positive and negative outcomes can

be considered through 'what if'-questions. Furthermore, Carroll (2000) sees scenarios as a tool to promote work-oriented communication among stakeholders, helping to make design activities more accessible to a variety of people who thereby have the opportunity to participate in the process.

The objective of the current study was to understand these young people's future visions of work and their perceptions of the present manufacturing sector. This objective guided the analysis of the discussions, image choices and scenario writings inasmuch as our intention was to identify both coherence and disagreement in the young people's expressions. From such an analysis, needs and preferences can be drawn for specific purposes. There is also a presumption that the preferences of a particular target group can provide value beyond that of any singular development process and that needs last longer than any solution (Patniak et al., 1999). In the analysis, we were able to draw conclusions based on individual analysis and emerging vertical patterns in the material. Individual horizontal analysis is said to identify both implicit and explicit statements and vertical analysis is said to assist in clustering statements into higher-level categories and themes through identification of common and shared statements (Thomsson, 2010).

The purpose of this study has not been to use the young people's statements as representative of general attitudes and opinions among all adolescents. In contrast, our intention has been to use the scenarios as inputs and stimuli for discussion. Thus, in workshop activities with other stakeholder groups, we have discussed the scenarios' implications for the Swedish manufacturing sector.

#### 4. Findings

As mentioned above, in the analysis of the material, we strived for identification of individual values and preferences as well as overall themes among all scenarios regarding future work and workplaces. The individual preferences among this group of young people consist of values such as making good money, having flexible working hours, being able to travel and having creative and challenging work tasks. Several of the individual values in this study have also been described in previous studies that have not focused on young people in particular (e.g., Judge et al., 1997; Lievens et al., 2003; Highhouse et al., 2003; Lievens et al., 2007; King et al., 2005; 2008). These individual values and preferences expressed by the young people will serve as the basis for proposed criteria for future industrial workers in the Future Factory project.

In addition, the overall themes in the scenarios illustrate some interesting trends. The young generation of today is said to be facing a substantially different situation than previous ones due to the many different life choices that today's young people face (Gillberg, 2010). According to this view, life choices impact how individuals see themselves. For example, the increased amount of information from media and internet, the increased space for taking action, the liberation from local contexts and the understanding of the possibility of doing things in completely different ways are all aspects that are said to influence and have consequences for today's youths (Ziebertz et al., 2005; Lindgren et al., 2005; Gillberg, 2010). In the scenarios, the overall themes consist of an ambition to make a difference, 'do good' and expresses great environmental awareness. In several of the scenarios, the young people accentuate a value of both individual and corporate social responsibility. For example, some of the young people in the scenarios emphasised "doing something that benefits all humans" as well as company-specific environmental aspects, such as products being sustainable, ecological and recyclable, technologies being environmental friendly, energy being provided by own production and premises being "in harmony with nature". Several of the young people stressed transformation of thinking and acting regarding production. Most of the young people seemed optimistic towards the prospect of being able to do so; however, not all shared this view. In the following text, we have translated some quotes we found to be significant and given them aliases in order to depersonalise them. The preference for "making a difference" and "doing good" is illustrated in the following quote from one of the scenarios:

*"To work within industry must be a 'good' job, something that people all around the world benefit from. The workplace should be well designed, as a work environment should be, not as they are in factories. Every employee cares for the environment and society as much as I do. I would like to be a person that comes up with solutions for a better future for all humans, including solutions for better working environments."* (Anna, 18)

However, as already mentioned, some of the young people expressed a cynical, alienated, pessimistic, disillusioned perspective, which Eckersley (1999) refers to as a transformational attitude. The following quote is indicative of this:

*"It feels as if the factories of today are destroying the Earth, polluting it, because we humans always want more and therefore are getting lazier and fatter. For me, it reflects human's selfishness."* (Karl, 18)

In the expressions of disillusioned and pessimistic perspectives, as illustrated above, values are not clearly

elucidated. Still, we consider them to be illustrations of some of the aforementioned requests for transformation of ways of thinking regarding production and social responsibility. They express an aversion towards factory work and all things associated with it, which these young people express as, for example monotonous repetitive tasks, hierarchies, pollutions and the “ever increasing production of worthless products”.

To further illustrate the discrepancy in the young people’s visions of a future factory, we present two scenarios: utopia and dystopia, originating from the young people’s scenarios. These scenarios could be described as ideal types (Weber, 1983) that highlight certain purified features of phenomena expressed by the young people. An ideal type can be a tool to describe and explain functions and characteristics of certain social phenomena (Weber, 1983). By presenting these scenarios, we believe that they can assist in a better understanding of these young people’s visions of the future as well as stimulate critical reflection on the manufacturing sector. Parrish (2006) also recognises scenario narratives as means for shared values among groups of people. Therefore, our method has been to share both the young people’s visions and their concerns with other project stakeholder groups, with the scenarios thus becoming a tool for dialogue. The following two scenarios are the result of our analysis, meaning that although the young participants in the activity have not written them, all the input information comes from their scenarios. However, we believe these scenarios, accompanied by some images of the young people’s choices (see figures 1-4), serve a useful role both in presenting the discrepancies in the young people’s visions and in presenting the communicative tool of scenarios.

#### 4.1 Utopia scenario

The Future Factory is situated in a big city, although there are a lot of parks and green areas in the vicinity. The location ensures easy access to work and is in a community with day-care centers, schools and shops nearby. The Future Factory has clean, bright and airy working environments. The premises have nice interiors with ‘modern designs’ and the factory itself has a ‘modern architecture’ that blends into the city. All facilities are situated close to each other, contributing to a transparent and flat organization. An important aspect in the Future Factory is the social responsibility taken on by the company and all employees. This includes environmental concerns being considered in every aspect of work and production and the company financing projects to assist the third world, for example.

The main part of work is done above ground, but some automated production is situated below ground and performed in office-like environments. The work includes creative tasks, with workers continuously learning and participating in innovative production system development. Working in the Future Factory includes travelling opportunities and collaborating with a diversity of people from all over the world. All employees participate in product and production development. As a co-worker in the future factory, you have access to several sports and relaxation facilities. It is a challenging but not physically demanding job; technology does the heavy work without replacing the humans. Work colleagues in the Future Factory are committed to do a good job, prefer working in teams and have the social skills to do so. Women and men, of course, work on equal terms. All employees feel important and needed and there are constant dialogues and participatory activities to ensure an open space with opportunities to influence the company, a good psychosocial climate and a search for prospective innovations. Working at the Future Factory is a respectable job for which each co-worker has been chosen with care and in which you make good money.

Figure 1.

Figure 2.

#### 4.2 Dystopia scenario

The Future Factory is yet one more of the plants destroying the Earth. It is located in a designated area separate from human living zones, one in which no one cares about whether pollution and environmental toxins destroy nature. To be able to work here safely, you have to wear gas masks; however, no one does because the workers do not understand that the environment is dangerous and no one tells them.

This factory has these conditions because of humans’ constant striving for short-term profits and the ever-increasing production of goods. In the past few decades, robots have replaced most of the human work force, although in recent years, humans have become cheaper than technology, resulting in the Future Factory now hiring personnel. The work involves monotonous and repetitive tasks in an assembly line, resulting in work-related ill health for most employees. Some job tasks consist of boring operating tasks, running the out-dated automated production machines that still work. The working environment is dirty, and there is no way to see outside when you are in the plant. Still, most workers are happy to do the job, because finding a job is not easy these days, even though the pay is not enough to feed a family.

Employees do not understand what they are doing or why they are doing the tasks; nobody tells them anything. They have never seen, or let alone spoken to, managers, whom the workers refer to as the 'the invisible force'.

Figure 3.

Figure 4.

#### 4.3 Dialogues

With inspiration from Schön (1995), the next step meant reflecting on the scenarios in workshops with people working within the manufacturing sector. In a series of workshops, 18 female production engineers, systems designers, human resource managers, CEOs, industrial designers, architects, students and researchers from 11 companies participated in the design of a conceptual future factory. In the first of these workshops, the Utopia and Dystopia scenarios were introduced as well as both the individual and overall visions and concerns that the young people expressed during the workshop. In the succeeding workshops, the scenarios were used for critical reflections on current systems, change processes and future solutions. Beforehand, we considered that the scenarios expressed idealized positive and negative visions, illustrating both visions and concerns held by these young people. The participants, however, experienced the utopian scenario as not idealistic, but rather a description of current practice or practice in upcoming years. The following quotation from one of the participants is indicative of this:

*"This is just like a description of our corporation! This is certainly not utopian; this is how we work today. Then, perhaps we can't be in the middle of a big city, however we work actively with parks and green spaces, because it's nice and because it picks up dust and makes a better working environment. We try to make our premises attractive and nice, but it's not easy with an old plant. We would like to have this transparency between different activities, but as I said, we have the buildings and premises we have. However, we try to find tools for better communication and cooperation."*

This quotation can be seen as an expression of people within the manufacturing sector having a different image and perception of manufacturing work compared with people outside the industrial sector. This is reminiscent of the aforementioned description of a 'future gap' as the discrepancy between perceptions and images held by internal and external stakeholders (Miles et al., 2006). One explanation is that the current industrial sector actually has a similarity with the utopian scenario, meaning that external stakeholders have little awareness and understanding of contemporary manufacturing. Another explanation can be that 'insiders' do not compare themselves with other sectors, as, e.g., young people do, and that this proposed new and transformed industrial sector has not been communicated to people outside the sector. Whatever the explanation is, this reveals a need to communicate with stakeholders to a greater extent. When the participants were asked to reflect on actions and activities, to communicate strategies and visions and to gain stakeholders' views and interests, one participant said the following:

*"Social engagement and social responsibility is very important now, we make a sustainability report every year that includes how we work with various activities such as ethical issues, environmental issues and so on. And of course we work in teams and try to cooperate between various divisions, it is important to involve different skills in dialogues. One of our employees recently said that he felt really involved in the business and finally understood the challenges. It is not possible today to just decide something and then tell people to do it, you need to think and learn about why the change is needed. All companies work in this direction, it is not utopian - it is what we do today."*

This quotation illustrates an increased awareness of dialogues with internal stakeholders as important, although as other participants have reflected as well, it indicates little or no collaboration with external stakeholders.

Based on our understanding, the participants have an awareness of the need for greater communication of the industrial sector's business and activities, although none of them have so far worked with a diversity of stakeholders on these issues. One conclusion from the study is, therefore, that although the participants did not think that the scenarios provided innovative ideas about practice, the scenarios did provide an understanding of the need for communication among multiple stakeholders. In several of the workshops, the participants discussed the scenarios in a very lively manner; hence, we believe the scenarios have provided some kind of lasting impression. The dystopian scenario turned out to be a provocation that initially made the participants defend the industrial sector in general and their own businesses in particular. After some reflection, they agreed that there could be such a perception of the sector in society and perhaps even more so among young people. According to these participants, the industrial sector does not communicate the business properly, and as a consequence, many people neither know what a contemporary factory looks like nor how it operates. The following quote indicates

one participant's first impression of the dystopia scenario;

*"Wow, that was really bleak! However, I can't see this coming. People demand more today, not just work for eight hours or so, they want fulfillment and challenges as well. We have to consider how to become more attractive employers."*

In the dialogues, the participants talked about various stakeholder activities that could contribute to becoming more attractive employers and to making production more effective and sustainable, as illustrated in the following quotation:

*"I work with environmental issues, and Dystopia deals with issues I deal with every day. This is something we are very much aware of today, both in our company and in the society. We try to work pro-actively with education of all employees so they understand their role in this. Then about producing more and more goods, well that is the reality we have. But the challenge is it to make these things work together; I mean, if we make profit, we can invest more in social responsibility. There may not even be a contradiction in working with environmental awareness and produce more effectively: some investments pay off in decreased maintenance for example, you just have to be aware of it and work with it constantly in mind. For me, it's the future; you should consider the resources, the environment and the working environment continuously in order to become a more effective and attractive work place. It is important to recognize the connections between social responsibility and effective production, to see 'the big picture'."*

We consider this quote to be indicative of an understanding of social responsibilities as important and as activities that may contribute to both social and economic interests. The scenarios helped illustrate various images and perceptions that exist of the industrial sector, and thus the scenarios contributed to a discussion of the need for multi-stakeholder dialogues. This awareness could be achieved by other means; however, we consider the scenarios to be an effective tool in communicating visions and concerns from stakeholder groups that the participants rarely involve in their companies. In sum, the scenarios proved to be a valuable tool for illustrating the future gap between internal and external stakeholders' perceptions of the sector.

## 5. Discussion

There is a saying stating that the best way to predict the future is to invent it (Kay, 1989). One way of looking at this study is to see it as a way of striving to predict the future by discussing multiple stakeholders' needs and preferences and consequently inventing a conceptual future factory based on this. Furthermore, the project's aim has been to create a vision of a good future factory design, with a production system, workplace premises, employee interactions and experiences that not only are functional but also are satisfying symbolic dimensions for multiple stakeholders. Within the field of design, this is a common approach to developing solutions to proclaimed problems. Our understanding of the industrial sector is that manufacturing companies in general have not had a need to promote themselves as employers of choice and thus have not seen a need to communicate with multiple stakeholders. The Commission of European Communities proclaims a need for companies to become involved in stakeholder activities because it "matters to our children and future generations who expect to live in a world that respect people and nature" (Commission of the European Communities, 2006 p. 10). Based on these claims, and on Donaldson and Preston's aforementioned emphasis on stakeholder relationships for their own sake, we believe there is a need for multiple stakeholder activities within the industrial sector.

Furthermore, we propose that most companies should consider young people as an interest group. They can, we argue, provide a different perspective on aspects of corporate activity. For example, young people who express negative attitudes towards industrial work can be seen as stakeholders insofar as they are prospective employees, customers or investors, or simply as part of a wider society with which the companies should interact for democratic reasons. We think that the future of the industrial sector is in need of a transformation of how the sector reacts to and interact with a diversity of stakeholders. According to Wells (1998), in order for firms to be competitive in the future they need to engage with the complexities of the environment in new and innovative ways. Additionally, Freeman (1984) proposes that positive financial outcomes will result from engaging with stakeholders, in addition to emphasizing the need for stakeholder participation for its own sake. However, according to Pedersen (2006), positive financial outcomes from stakeholder activities are difficult to measure in traditional ways because there cannot be a clear-cut distinction between social and economic interests, as economic decisions have social consequences and vice versa.

As mentioned above, the aim of this paper has been to explore future scenarios as a means for multi-stakeholder dialogues. Therefore, we have strived to illustrate scenarios as a tool for communicating various stakeholders' needs and preferences as well as to use the scenarios for critical reflections on strategies and visions with multiple stakeholders. Employing a design approach for us means placing humans at the heart of solutions,

thereby including various stakeholders as experts on their own needs and preferences.

Within the field of design, it is recognized that problems can only be analyzed by being solved (Carroll, 2000), meaning that it is the exploration of context and situations that creates understanding that leads to satisfying solutions. Good design goes beyond problem solving; as mentioned above, it creates systems, spaces, interactions and experiences that also satisfy symbolic dimensions for stakeholders.

The Future Factory project idea originated from the difficulty in recruiting women and young people to the Swedish manufacturing sector. Therefore, a proactive approach of including those stakeholder groups in explorations of the future was used in the project. The idea is that a thorough exploration with multiple stakeholders would better secure a good project outcome. Despite the design approach of this project, the problem is not yet solved; we do not present a general solution for how to attract more women or young people. Rather, in this paper, we aimed to promote critical reflections on the implications of a business sector doing things the 'traditional way', meaning not including multi-stakeholders in dialogues about future strategies and visions. Conversely, in this paper, the use of scenarios as a tool for multi-stakeholder dialogues has been explored.

The study included discussions and scenario writings due to the consideration that these would provide us with richer information than material gained from surveys or interviews. Despite this being a study that does not aim to generalize findings to all young people's values for future work and workplaces, we consider the scenario-based design to be a useful tool for communicating visions and concerns held by some stakeholders. Therefore, one conclusion is that the use of scenarios resulted in rich material of visions and concerns of the future held by these young people. In addition, the use of scenarios for critical reflections assisted in illustrating a gap between perceptions and images held by people working within the sector and these young people. We believe that this 'future gap' needs to be addressed with better communication than is currently employed in practice and with a more pro-active participatory dialogue with multiple stakeholders concerning future activities. Negative attitudes towards a sector represent a negative image and reputation of the business, and there is a concern among our participants about implications, such as a decrease in products and services or difficulty in recruiting personnel. So far, the manufacturing sector has had a good supply of labor and therefore has not been forced to take the symbolic dimensions of work and workplaces into account. All the same, the current interest in stakeholder relationships is said to point towards pressure on contemporary organizations to focus attention on the symbolic dimensions of their activities (Kärreman et al., 2008). As Hatch and Schultz (2003) state, the importance lies not only in positioning the company in the market but also in creating continuous development of organizational structure, physical design of premises and a workplace culture that supports the generation of meaning in the corporation.

In our view, taking on multiple stakeholder activities has the potential to be an effective approach for organizational development and change management. Dialogues with a diversity of both internal and external stakeholders can assist in communicating that the sector is an employer of choice and possibly contribute to securing future production. This is something we consider critical to the Swedish industrial sector. To do so, however, requires a shift from a focus on rationality and standardization towards exploration of multiple stakeholders' values and visions of work and workplaces.

We recognize that there are other perspectives that need to be addressed within stakeholder activities. For example, Prieto-Carron et al. (2006) suggest a perspective of power and class in addition to a focus on the Third World. In this study, however, we have focused on young people in relation to the Swedish manufacturing industry. The aim has been to explore means to address a multiple stakeholder perspective that can be used to address a variety of visions and concerns. In this, scenarios have shown great promise as useful tools for sharing stakeholder values, facilitating dialogues that have illustrated the possibility of increasing awareness of various perspectives and aspects. As Carroll (1997; 2000) states, maintaining a continuous focus on situations and their consequences for human work and activity promotes learning about the structure and dynamic of a problem domain, seeing situations from different perspectives and managing trade-offs to reach usable and effective outcomes. Kochan et al. (2000) claim the notion that corporate downsizing and outsourcing, stagnant wages, increased inequalities, and declining union representation among other things may have broken the value relationship for some of the industrial sector's stakeholders. They further assert that, in bringing together multiple interests, stakeholders of firms have the possibility of being managed effectively when facing future challenges. Additionally, Wells (1998) proposes that the way people think dictates what they see and hence the future for which they can conceive of a strategy. Our interpretation of this is that a multi-stakeholder relationship may contribute to a broadened perspective on the future and what strategies to undertake. Wells also proposes that the only limit to the possibilities of a company is the minds of its people and what they are able to originate;

hence, we think that multiple perspectives would provide greater possibilities.

Therefore, we propose that the industrial sector be pro-active and use scenarios as means for multiple stakeholder dialogues. In our view, this has the possibility of contributing to, e.g., a higher level of inclusion, life-long learning and employability, better innovation performance, a more positive image of the industrial sector, environmental protection and a fundamentally more sustainable future. Our proposal includes critical reflection on current concepts and practices through scenarios and active engagement with stakeholders. If today's young people express negative opinions about the manufacturing sector, we consider it high time for a transformation of the ways in which organizations involve and connect to stakeholders; it is time to take action to minimize the future gap.

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Figure 1. An illustration of some of the young people's preference for working environment (Photo: Author)



Figure 2. An illustration of the young people's preference for working in a big city (Photo: Author)



Figure 3. An illustration of a future vision of not being able to see outside (Photo: Author)

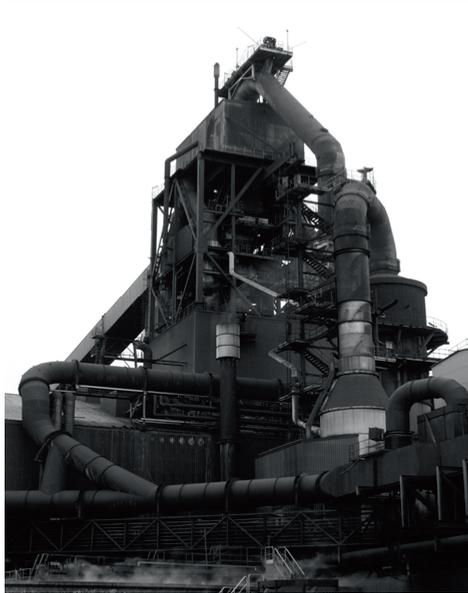


Figure 4. An illustration of a dystopian future perspective (Photo: Author)

## *Paper 4*



Källhammer, E. & Wikberg Nilsson, Å. (forthcoming 2012) Gendered innovative design – critical reflections stimulated by personas. In E. Gunnarsson, E. Sundin, K. Berglund & S. Andersson's (eds.) *Gendering Innovation*, Stockholm: Vinnova.

# **Gendered innovative design** - critical reflections stimulated by personas

Eva Källhammer & Åsa Wikberg Nilsson

Källhammer, E. & Wikberg Nilsson, Å. (forthcoming 2012) Gendered innovative design – critical reflections stimulated by personas. In E. Gunnarsson, E. Sundin, K. Berglund & S. Andersson's (eds.) *Gendering Innovation*, Stockholm: Vinnova.

## **Abstract**

In focus in this chapter is the re-designing of the Persona method into a tool for critical reflections of gender issues in entrepreneurship and innovation systems. Whereas such systems often are considered gender neutral, we in contrast are emphasizing the need for communicating and discussing the 'doing of gender' with actors within those constellations. The aim of this paper is to explore our development of the Persona method for action based design in gender equality interventions. A persona is a fictional character that in our research work is used for increasing gender awareness in interventions. The method is used for communicating issues and concerns as well as visions in participatory inquiries. In our experience the Persona method engages people in dialogues about gender, people that are not familiar with gender theories at all. Therefore, we consider the action based design by means of personas to contribute to talk beyond that of the "problematic women issue" and show a way to, not only illustrate and discuss gender inequality, but to actually challenge and – in the long run – be one way to unsettle conventional beliefs of gender.

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# 1 Introduction

The subject of this chapter is an action-based research approach, in which we are particularly focusing on a re-designed practical method for collaborative gender analysis in entrepreneurship and innovation systems. Other contributions in this book demonstrate that traditional entrepreneurship and innovation systems preserve and even reproduce unequal gender structures. Whereas there generally exists rhetoric of gender equality as relevant within most Swedish organizations, the general gender mainstreaming tactic of pointing out women as in need of remedial efforts may in contrast contribute to a preserving of, rather than challenging of, gender constructions (Lorber, 2000; Ahl, 2004; 2006; Fältholm et al., 2010). Even if this insight is not new, it calls for new, theoretically as well as methodologically, approaches. Gender research needs to move forward, not by merely establishing and describing gender inequality, but also by actually challenging gendered structures. For this reason, there is a need for new intervention designs that communicate gender theories in a less academic and more practice-oriented language; in short, we propose a merge between design methods and gender theory. Thus, the aim of this paper is to explore our use of the design method Personas for critical reflections in gender equality interventions.

One understanding of the concept of innovation is as something new, useful and/or commercially successful (Schumpeter, 1983). However, there is argument for considerations of 'newness' as depending on what is new, how new, and new to whom (Johannessen et al., 2001). Some 'innovations' could hence in this perspective more be a matter

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of incremental change, meaning building on and reinforcing what already exists, rather than radical change as something that breaks the stable states as a way to build something completely new and desirable (Schön, 1973). In the field of design, there is continuous training in breaking established rules and patterns. Simon (1996 p.114-115) argues that whereas “the natural sciences are concerned with how things are, [...] design, on the other hand, is concerned with how things ought to be”. In our action-based approach we combine the ideology of design as emphasizing human experiences and use situations, and the field of gender as stressing equality and diversity, for building innovative and more socially robust future businesses. In this chapter, we for this reason illustrate one way of involving stakeholders in critical reflections of current states and imaginations of future possibilities. The way we communicate gender, we suggest as one important aspect to make change possible.

In parallel with the increasing interest in entrepreneurship and innovation, other contributions in this book illustrate methods and tools developed with the objective to move beyond ‘armchair feminism’ in gender research (see e.g. Gunnarsson, 2012; Andersson & Amundsdotter, 2012; Lundkvist & Westberg, 2012). Likewise, in this chapter we explore a practical tool for increasing gender awareness; the Persona method. A persona is a fictive character illustrating and communicating issues and situations identified during an initial mapping. This well-known design method is traditionally used for design teams to engage in user experiences (Cooper, 1999) and in so doing, design future artefacts that better fit user's life worlds. Our contribution deals with re-designing the method for communicating gender issues in participatory interventions. By the means of

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Personas, some gender inequality experiences are reflected; the tool hence contribute to increased gender awareness, and illustrate possibility of being one force to change obsolete systems. For example, the Persona method is exemplified as useful for reflections on experienced realities, for an increased awareness of norms and values, and for dialogues of change (Wikberg Nilsson, et al., 2010).

The reason for implementing gender theory in innovation systems is the argument that gender equality contributes to create a more favourable environment for growth (Kveine et al., 2011). Another reason is the statement that diversity appears to contribute to creative environments (Florida, 2002). Thus, our contribution deals with both to identify the gendered aspects of the innovation systems and to increase gender awareness in collaborative activities.

In this chapter we first outline the starting premises for our action based research design. Thereafter we present the research projects, as context for the two personas, which are presented as illustrations of how the method can be used for gender reflections. We also demonstrate the 'switching of gender', as a way of further reframing participants' understandings of gender constructions. In the final part of this chapter we propose that the Persona method may be a way to, not only illustrate and discuss gender inequality, but to actually challenge and – in the long run – fundamentally and sustainably contribute to a change of gender constructions.

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## 2 Innovation and design

Entrepreneurship and innovation theory stem mainly from economist Schumpeter's (1983) notions of innovation as new ways of combining ideas and organizing businesses and activities. According to Schumpeter, innovations are always discontinuous, meaning radically new. However, Schön (1973) argues that this often means talks of small steps of transformation rather than radical change that tear down obsolete structures in order to create something new. In later studies, the terms incremental and radical innovation have gained acceptance (Dewar & Dutton, 1986). In this, incremental means small steps of transformation and radical means significantly different from previously known. The various classifications of innovation are interesting since they reveal a lot of what is considered innovative and what is not. For example, in *Innovative Sweden* (2004) the industry sector is emphasized as the business that has the ability of creating value and growth by being innovative. The paradox is that the industry sector emphasizes continuous improvements rather than radical innovations. Additionally, within academic entrepreneurship, innovation is mainly considered with a bounded rationality of traditional male areas and competences (Fältholm et al., 2010). Based on Schumpeter's view, this is not radically new ways of thinking; hence, this does not lead to growth and new businesses, only a continued stable state.

Within the field of design, there is continuous training in breaking established rules and patterns and thinking in terms of alternative. This does not mean that designers own the concept of innovation, as Edeholt (2004) proposes, it rather implies design as a deeply rooted human activity that is given

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further training within design educations. The process of design is referred to as an intervention aiming at changing an existing stage into something better (Simon, 1996). In general, the design process is not explicitly spoken of as radical or incremental, innovative or optimizing, since what is considered to be radical and innovative in one situation may rather be seen as simply incremental and/or optimizing in another (Edeholt, 2004). Likewise, Johannessen et al. (2001) stress the perception of innovation associates to who perceive it as such. Illustrating this, is Simon's (1996) notion of 'satisficing', describing how people in general do not aim for the best possible solution, but instead are content with 'good enough' solutions. A relevant question hence is if the same phenomenon applies for innovation as well; that incremental innovations are considered as 'good enough' solutions within business?

Consequently, we propose a need for involving a multitude of actors in interventions, in order to discuss a variety of perceptions of what is innovative and what simply is 'good enough', who is allowed to be innovative and who is not, and particularly in future imaginations of what an innovative society could be. Accordingly, Kveine et al. (2011) propose several drivers for realizing gender theory in innovation systems. For example, in the competition for well-educated employees, in gender diversity as driver for creativity and innovation, and in competition with user-driven innovation and gender as means of design innovation. In summary, a gender perspective may contribute to thinking new. Correspondingly, Sherry (2003) argues that innovation involves a process of radically changing the form or function of a thing, a system or a person. This implies a reframing of mind-sets and new approaches to thinking new. An innovative

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business may hence facilitate 'thinking new' by promoting different perspectives and perceptions within current activities.

The action-based research (AR) design we use draws inspiration of *critical reflections* as necessary for change, as discussed by e.g. Freire (2000), Dewey (1998a; 1998b), Schön (1995) and Argyris (1991). For example, these authors seem to agree on change only being accomplished through critical reflections that allow actors to become aware of alternative understandings of contexts and situations. This obviously assumes that actors are able to take action and change the structures of their lives. Dewey coined the concept of 'reflective thinking', meaning that turning a "subject over in the mind and giving it serious and consecutive consideration" is needed to realize change (Dewey, 1998a p.3). Nevertheless, this requires a prevailing norm to reflect upon, stereotypical assumptions of what is female and what is male is one example of such norm. Elsewhere, Dewey discussed 'experienced realities' as an important notion to grasp; meaning that there are a variety of experiences that are equally 'real' to the actors involved. This is in his view vital for a more human life world (Dewey, 1998b). The ambition has for this reason in our activities been to facilitate reflection on existing experiences in order to ensure sustainable change. Schön (1995) refers to this as creating a reflective mind-set, meaning that being involved in serious discussions of various interpretations and perceptions of situations and practices contributes to changed mindsets. Otherwise a community of practice may find it difficult in escaping established ways of thinking, even if criticism is put forward (Argyris, 1991). Thus, the motivation for this approach is the basic assumption in AR that people learn better and are more willing to apply

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what they have learned, when they have participated in the development process (Lewin, 1947).

However, at the same time there is criticism of reflection not contributing enough to considerations and change. For example, Haraway (1997) instead uses the metaphor of 'diffraction' for reflections on a diversity of meanings and experiences. Drawing on diffraction means to both critically reflecting on the current state of things, and furthermore constructively imagining how things ought to be in the future. Consequently, an important argument is to not just talk and discuss current gender inequality, but to actually take action for change. However, change must be preceded of awareness of various experienced realities.

## **2.1 The design of gender**

The general understanding of gender is the dichotomy between women or men, in other words, a division according to biological sex. However, within the field of gender research the objective often is to explore the social construction of gender; i.e. the subjective perceptions of female and male that are present within certain contexts and society as a whole. Given the discussion of the need for realizing alternatives to become more innovative, we propose the same reasoning goes for gender constructions. With a social constructionist view the process of 'doing gender' can be seen as undertaken in social interactions that pursuits as feminine and masculine 'natures' (West & Zimmerman, 1987; Acker, 1999). The relevance of this perspective is that social constructions of gender, in contrast to biological sex, therefore are not natural, biological, eternal or 'true'. Gender identity is said to be an

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unstable, multifaceted, and variable construction, which is dependent on the various discourses that affect each individual (Hollway, 1996). For this reason, gender inequality seems to be a result of stereotyping of women and men and taken-for-granted assumptions, values and practices that result in certain men gaining power and privilege at the expense of women and other men. To illustrate this, Acker (1999) argues that the doing of gender within organizations can be identified as four gender processes. With inspiration from Acker, we refer to the processes as structures, symbols, interactions and individual identity, as illustrated in Figure 1.

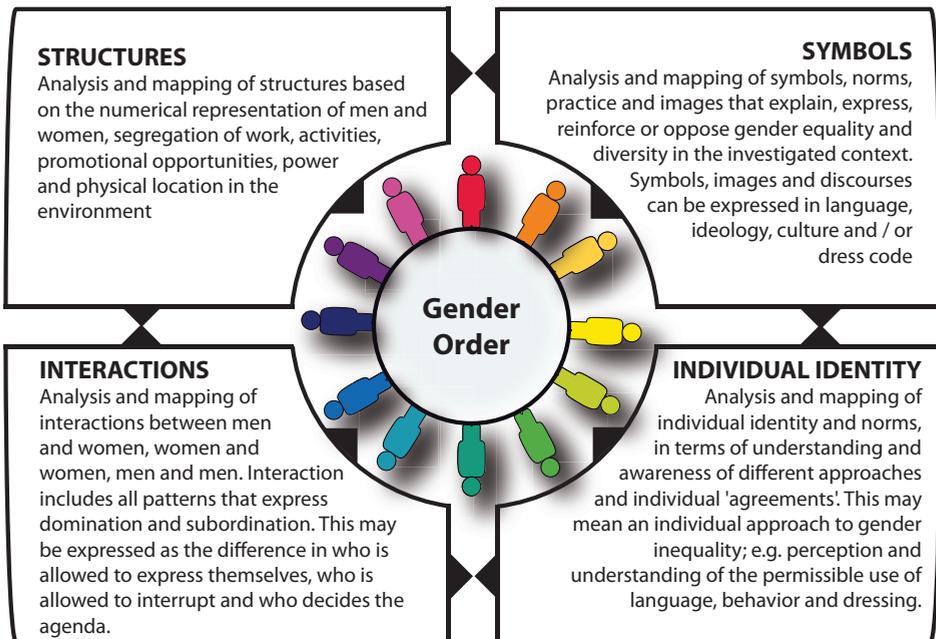


Figure 1. Illustrates our model for mapping and analyzing gender, with inspiration of Acker (1999). In the intersection of these four gender processes, a gender order is produced. Illustration: Åsa Wikberg Nilsson

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These four processes were used for mapping and contextualization for our persona development and as a framework for our participants to reflect on their own experienced realities. Using the Persona method for creating gender awareness can therefore be seen as Haraway's concept of diffraction. Accordingly, the ideology in AR is that actors act as co-inquirers, reflecting on their own practice, ideally reframe their understandings and take action for change (Rasmussen, 2004).

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### 3 Persona design

A persona is a fictional description of a person, whose characteristics are of importance for the project it is designed for (Nielsen, 2007). It is a frequently used design method to focus a development process on users' needs and preferences (Cooper, 1999). Based on one of the author's previous experience of the method within the field of design, the objective in the present research studies has been to test, further develop and evaluate the Persona method for applied gender research. The research basis for our persona development is qualitative, drawing on interviews, observations, focus groups and workshop activities. Developing a persona is an iterative process, consisting of mapping, contextualizing, characterization, persona and scenario creation and validation (Cooper, 1999; Grudin & Pruitt, 2002; 2003; Pruitt & Adlin, 2006; Nielsen, 2004; 2007).

The personas are formed, consisting of a *body*; a fictive name and an image to illustrate the character, a *psyche*; such as an overall attitude towards life, work and the situation designed for, a *background*; e.g. social background, education, upbringing which influence abilities, attitudes and understanding of the world, and finally *personal traits* which brings the Persona to life and makes it an engaging character rather than a flat stereotype (Nielsen, 2004). The fictional details in a persona are included in order to increase communication and commitment to the character.

In line with this are gender researcher's suggestions of mapping an organization's symbols; what kind of images and values are used (Acker, 1999), and in relation to employees

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behaviours, such as who is doing what and how, where, when, and in what circumstances (Acker, 1999).

Based on our understanding, Persona is in itself basically a different way of presenting an empiric material; it is during the interaction with people it becomes a valuable tool for discussing and challenging unequal gender orders. For this reason, we emphasize to place the persona in a scenario to make 'her' valuable. In this context a scenario is a story, with a character (the persona), a context where the action takes place, goals that the persona wants to achieve and actions that the persona takes to fulfil those goals. The persona development process is described in the model presented in Figure 2.

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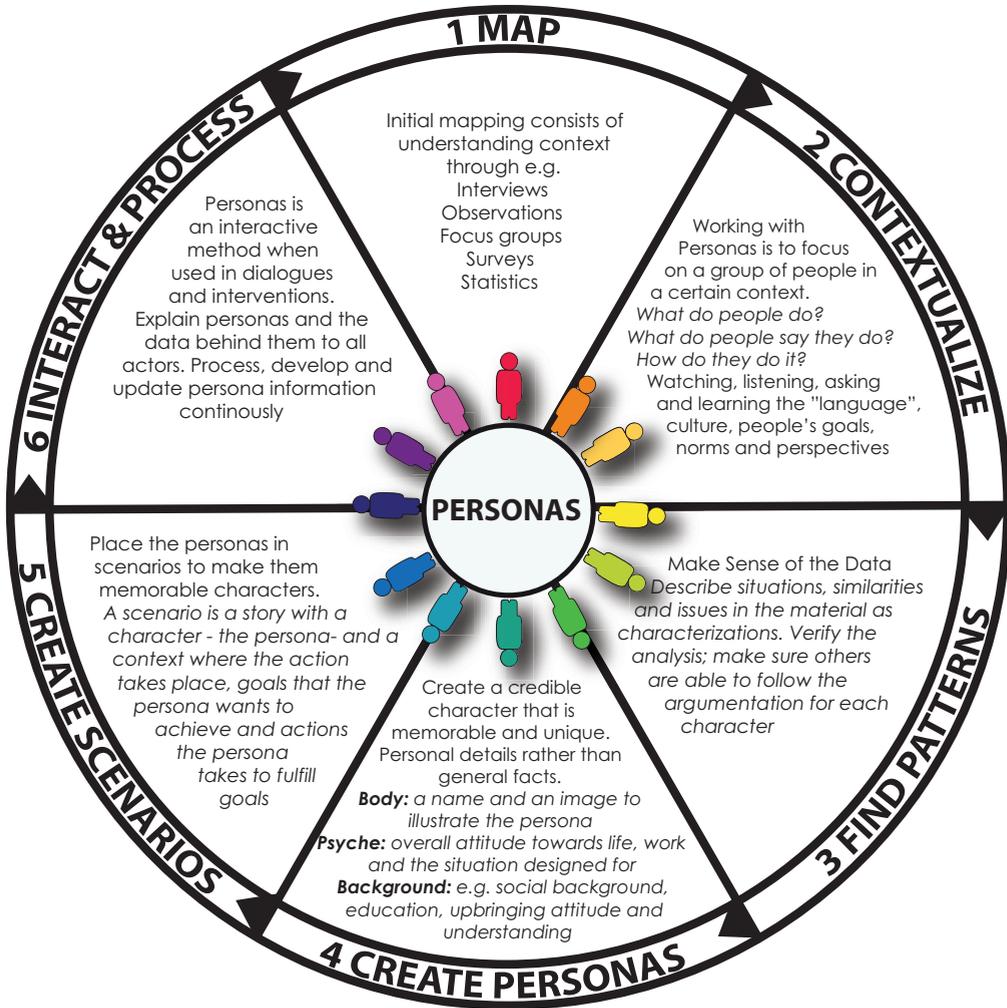


Figure 2. Illustrates our process of making a persona. Illustration: Åsa Wikberg Nilsson

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### 3.1 *Persona approach*

The Persona method was used in two research projects, see overview in Table 1.

Table 1. Overview of the two research projects that forms the basis of the current research

	<b>'The Future Factory'</b>	<b>'Daring Gender'</b>
<b>Context</b>	Swedish industry sector	Swedish universities
<b>Aim</b>	Collaborative design of visions of a future factory emphasising women and young people's participation	Create gender awareness and contribute to equal and innovative environments
<b>Mapping</b>	<b>121</b> participants in interviews and future workshops	<b>117</b> participants in interviews and workshops
<b>Personas used</b>	Anna, Dan, Eva - and Svea	Sven & Sara, Leif, Anita, Mats
<b>Relevance</b>	A 'social innovation and experiment' that can be one way to unsettle gender inequality	A 'social innovation and experiment' that can be one way to unsettle gender inequality

In the Future Factory project, personas were used to focus participants on various experienced realities in the context of the Swedish industry sector. In this project we initially performed interviews and observations. Based on this mapping, three personas were created and discussed in activities with interest groups such as a group of young people aged 17 to 18 years, several trade unions representatives and several representatives of both industrial employees and

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employers. In the subsequent work within a design team; a group of women engineers, production technicians, CEO's, human resource managers, system designers, industrial designers, architects as well as students and researchers, the method was used to focus the outcomes on these personas (see Wikberg Nilsson et al., 2010). In collaborations, we have further developed the method by making a future 'ideal' persona; Svea is fictive character that works in the future factory where gender no longer is an issue, where power and possibilities are equally distributed and where innovation and entrepreneurial actions can be undertaken by both women and men. Accordingly, the participant's vision of the Future Factory illustrate an innovative business that contributes to sustainable growth in the region, where there are equally as many women and men as role models on all positions. Naturally, visions are one thing and realization another. This approach associates with what Jungk (1987) refers to as a 'social innovation', in the experiment of what can support change of stable orders. According to Jungk, future imaginations contribute to reduce apprehension of change and thereby strengthen the possibility of realization.

In the Daring Gender project, personas are currently used to challenge gender perspectives at two Swedish universities, with the aim to raise gender awareness, initiate change in order to include both women and men, and thus contribute to equality, innovative environments and sustainable growth (see Fältholm, et al., 2010). In this project, the initial mapping consisted of a statistical review of Swedish universities structures, followed by 72 interviews as well as workshop activities including 45 participants to learn and understand the current practice of doing gender within so-called 'entrepreneurial universities' (Etzkowitz et al., 2000).

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Initially the research contexts were explored with the help of Acker's (1999) model, i.e. mapping of structures; gender divisions of work, men and women's location in physical space in terms of research areas or workplace tasks. The further inquiry concerned with symbols and images, used to 'explain' the respective organizations. Working with personas is to focus on a group of people in a certain context and it is therefore stressed to understand the context and the people within (Nielsen, 2007). The next step was to analyse the material, since it is said that the analysis reveals patterns that consequently provide the base for a persona (Cooper, 1999). As aforementioned, the researches focus on increasing gender awareness consequently made us in the analyses focusing on issues and situations that dealt with gender issues. Subsequently, we developed a number of personas for each project.

Until this phase in the process, a persona appears as basically a different way of presenting an empirical material, and one way for a researcher to understand the context and the practice within. In the next phase, however, the interactions with actors from the respective contexts commence; in the current case contexts of university, industry and, to some extent, society. During this phase, we present the personas to actors within the contexts and discuss the characters' scenarios. It is said that a persona development process ideally should include 'all concerned' to ensure its validity (Nielsen, 2007). There are further arguments for validation of research results by including actors from outside the research community to produce more socially robust knowledge (Novotny, Scott & Gibbons, 2001; Gunnarsson, 2007). For this reason, we discuss the personas in collaborative activities to ensure them as credible characters within the projects'

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contexts. This results in a continuous development of our personas as participants provide us with new insights and knowledge. A usual procedure is that the personas are presented during a workshop and the participants are asked to reflect on the scenario. In addition to this, participants were developing personas, as a way to stimulate critical reflection of the present and the future.

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## 4 Persona experiences

In this section we present our findings as two personas and describe our experiences of using the method in two interactive projects. After the presentation and elaboration of persona Anna and Sven, we present our experiences of using 'switching gender' to further reframe participants' awareness of gender constructions in research contexts.

### 4.1 Persona Anna

Persona Anna was used in *the Future Factory*, a three-year action based research project, performed in collaboration with various interest groups. The project idea was to challenge traditional design of production systems by including groups that normally do not participate in change processes. For the reasons of the heavy male domination within the Swedish industry sector<sup>1</sup> and the fact that young people opt out of industrial work (Ziebertz & Kay, 2005), we in this project chose to specially emphasize women's and young people's needs and preferences in the design of a vision of a future factory. The action based approach was in this project used for design of a conceptual future factory in collaboration with a variety of project stakeholders such as employees and employers from the industry sector, trade unions and young people as prospective future employers, employees, shareholders or simply people with a stake in the future. The

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<sup>1</sup> 16.5 percent of the labour force within Swedish manufacturing industry are women, according to Statistics Sweden (2010)

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project approach can be seen as an innovation in itself, since it includes new thoughts, behaviours, and solutions that are qualitatively different from existing practices. A practical focus in the Future Factory project was to explore new practical approaches and methods for change and thinking new, and a theoretical focus was to develop knowledge of change by design.

Traditionally in the industry sector there has been a long-term stress on efficiency, which is said to result in a 'bounded rationality' on economic growth (Simon, 1997; Cairns et al., 2010). Currently there is a strong discourse in most European countries supporting innovation and entrepreneurship (e.g. European Commission, 2003; Innovative Sweden, 2004). We propose that the concept of innovation can be used for change of various dimensions within the industry sector. Put differently, talking about 'what might be' instead of 'what is' makes it possible to reflect on a variety of issues with a multitude of actors.

In the Future Factory project the Persona method was used as means for reflections on various experienced realities in activities with interest groups. Persona Anna's scenario is based on an initial mapping of Swedish industry sector. Some details are fictive, such as the name, age, and the image. Other details are taken directly from the mapping, for example, citations from interviews. As before mentioned, the story reflects some experiences of working within male dominated structures, and with work tasks coded as male (see e.g. Faulkner, 2001; Abrahamsson, 2002). Thus, this story addresses some experiences identified in our inquiry of the Swedish industry sector.



**“Anna”**

Photo 1. Illustrating persona Anna from the Future Factory project.

Photo: Nicke Johansson

This is Anna, a 27-year-old woman working within the Swedish industry sector. She works at an assembly line in a team of 13 people; all male apart from her. Anna thinks this is okay as she claims to always have been somewhat of a ‘tomboy’ as she also grew up with three older brothers. For example she learned to repair motorbikes before she started school.

At the production line, each work operation is time-constrained; during a given time Anna and her team are supposed to perform the tasks her station is assigned to. If she, or someone else, does something wrong or does not finish in time, a bell signals and the line stops. This happened to a woman working at the plant before Anna, they are still talking about “women not being fit for the job”

The mistake of one woman symbolizes all women’s mistakes, thus Anna is determined to do well, although her short length causes her some trouble. There is also the problem with clothing. Her male sized work wear does not fit very well since Anna is small and there are no women work wears. She folds up trousers legs and sleeves, but it is difficult to work effectively.

Anna has worked at the company for 1.5 years, and she is really determined to do a good job. The job is quite simple, ‘it is not like it is brain surgery’, says Anna, and ‘one learns the tasks in just a few weeks’. Anna’s manager has noted her efforts and would like Anna to get further training and thus new work tasks.

However, at this company it is the members of the work team who decide who will get the training, and they have turned down Anna’s application, based on the argument that no woman have done that job before.

*“I have thought a lot about this, why didn’t they want me for that job, when they knew I could do it? I think they felt challenged by a woman being able to do the same thing they do. I am so naïve, thinking they would consider it good to get a person committed to do a good job! [Laugh]”*

This incident has left Anna a bit puzzled, why didn’t her team members suggest her for the job, and does this mean she will she stay at the factory or not? Her manager is good though, for example, he always makes sure Anna is included when there are company presentations, photograph shoots and such things, though this is not that popular among her colleagues. *“I just want to do a good job and get some appreciation for that, that’s all!”* says Anna.

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Our experience of using persona Anna is that the participants have been troubled by the presented situation and have discussed what kind of actions to take in order to change the presented situation. Within the different interest groups where Anna has been presented, as far as we understand it, both “she” and the scenario have been identified as credible and several participants have told of similar incidents and issues. We consider the method useful for applied gender research since we work in collaboration with actors from industry and therefore people that have the possibility to take actions for change.

In addition to discussing issues and situations presented by our personas, the participants in one workshop developed a persona that the project outcome supposedly should ‘satisfy’. Persona Svea, as she is called, illustrates a somewhat idealistic situation where gender no longer is an issue, a situation similar to ideas of a ‘feministic de-gendering movement’ (Lorber, 2000). The future scenario of persona Svea also reflects current perspectives of innovation networking systems for economic and social benefits among other things. In our experience, the Persona method has shown prospects of being a tool to communicate and challenge gender constructions within the research context. For example, persona Anna has been presented and discussed with academics, industrial actors, government and students. In all of these various contexts and among a multitude of actors, the method has proven to be a useful tool to talk about gender without addressing the subject as ‘the problematic women issue’.

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## 4.2 Persona Sven

Persona Sven is based on issues and situations identified during our preliminary mapping, as was the case for persona Anna. Sven's story is of a somewhat stereotypical academic entrepreneur, who is active within a field dominated by men. In our mapping, we identified the structure as male dominated and Sven's behaviour and identity illustrates what we found as indicative of male academic entrepreneurs; i.e. being promoted by both sponsors and peers and with access to funding.

Persona Sven was used in '*Daring gender-academic entrepreneurship*' an integrated gender mainstreaming and interactive research project at two Swedish universities. The project could be defined as "a Knowledge Space" (Etzkowitz & Ranga, 2010), in which participants in entrepreneurship and innovation systems are exploring how gender is constructed in their respective environments. In the Daring Gender project, we are analysing, highlighting, challenging and, in the long run, contributing to a change of participants' awareness of gender constructions. The project idea is thus to address questions of how gender equality interventions should be designed within the arena of academic entrepreneurship. For example, Ahl (2004; 2006) illustrates that what is referred to as 'women entrepreneurship' rather sustains beliefs of men and women as fundamentally different, than seriously question existing norms of innovation and entrepreneurship as gender neutral. In the project we also question how support systems for the commercialization of research and collaboration with industry should be designed to attract and include both women and men. Rather than developing interventions that tend to restrict targeted women into 'entrepreneurial ghettos' (Fältholm et al., 2010), the main

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objective therefore is to challenge stereotypical ideas and taken-for-granted assumptions of gender and conceptions of entrepreneurship within the research context. In the Daring Gender project personas have been used as means for reflection of the concepts of innovation and entrepreneurship from a gender perspective.



### **“Sven”**

*Photo 2. Illustrating persona Sven from the Daring Gender project.*

*Photo: Istock*

This is Sven, a thirty-nine-year old associate professor within engineering faculty at the University. He comes from a family of entrepreneurs. Entrepreneurship and commercialization is hence not new for Sven, and within his research team, of fourteen men and one woman, almost everyone has a business on the side or has sold a product. Sven has a large network of companies and board members he meets on regular basis. According to him; *“To be entrepreneurial means to build bridges between academia and society, to find solution in collaboration with industry that meets market needs”*.

Even though the university is promoting entrepreneurship, sometimes Sven experiences entrepreneurship as not being accepted as a university activity. Though Sven persists: *“Commercialization of research is important because of its benefits for society. Research is the raw material that needs to be processed and packed by industry. You have to highlight what is valuable and frame it in marketable words- a success can lead to regional development and job creation”*. His research team is doing very well; they obtain a lot funding and have been able to recruit many doctorate students. However, *“It is like it’s dirty to make money on research, but I think it is ok as long as it does not compete with the universities activities”*, says Sven. He thinks academic entrepreneurship is about doing something of value for society, such as developing businesses and new products and considers the social field a bit “soft”, not doing ‘real valuable research’.

He has a family, his wife Annika works as a part-time pre-school teacher and they have two children, Johan and William. Sven considers them being quite equal, for example his ambition is to help Annika with e.g. the vacuuming, though Annika usually has finished by the time he gets home. He does not mind; after all he earns most of the money and does something valuable for society, his wife understands this. Usually Sven spends at least 60 hours at work and in addition works from his home office or is away on business trips. Still, Sven would like to have a bit more ‘quality time’ with his children, he used to play football himself and now his oldest son has started to play as well. Nevertheless, he did actually take parental leave when his youngest son was born, he is quite proud of having worked from home for ten whole days. This is not something the other men in his research team have done, and they often make fun of him being so “soft”.

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Our experience of using persona Sven is that 'his' scenario has raised a discussion about the paradox of being a successful academic entrepreneur, which makes it difficult to produce research articles, i.e. the measuring instrument that is currently used in Sweden for career promotion and university ranking. The so-called third mission for Swedish universities to collaborate with society, inform about their activities and promote useful research results (Högskolelag, 2009:45) is not valued within this system. Czarniawska and Genell (2002) recognize the paradox of company-like competitive universities that are measured and ranked through research contributions. This issue is a discussion we are able to have with the participants with the help of persona Sven.

Sven furthermore illustrates the entrepreneurial concept of inter alia doing something valuable for society, for regional growth and job creation. The entrepreneurial university discourse is quite powerful in Sweden, as Czarniawska and Genell (2002 p. 464) define; "People speak of markets, competitions, networks and strategies, as though these concepts can be taken for granted". In contrast to the so-called entrepreneurial discourse, we identified some scepticism among university employees regarding how to combine the idea of an entrepreneurial university with education and research based on a critical perspective, exemplified by e.g. Jacob et al. (2003).

In the mapping of Swedish academic entrepreneurial contexts, we also identified what could be called an entrepreneurial identity and behaviour, articulated as e.g. dedication to work, which is partially explained for, or excused by, the higher aim of 'doing something valuable' for society etc. However, when considering for example

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dedication to work from a gender perspective, the question is if the conditions for women and men are the same. For example, in the scenario of persona Sven, he is said to have an understanding wife, who works part-time, and who is responsible for their children and their home. Our experience is that with the help of persona Sven, we can address if the conditions would be the same if the gender were reversed, e.g. the different conditions the idea of the 'entrepreneurial university' possibly may hold for women and for men. Consequently, in our further development of the method and for the reason of being able to address different conditions for women and men, the next step taken in the projects has been to switch gender of the persona, as illustrated in the next section.

Sven's' scenario also addresses whether he is happy with the situation. This is for example articulated in his' desire for quality time with the children. The story of Sven, although illustrating a structure of male alliances, also deals with interaction aspects such as parental leave not being considered as a 'correct behaviour' for a man, illustrated in his colleagues making fun of him for being 'soft'. We believe this demonstrates arguments for some contemporary men having to deal with dual loyalties, in which the loyalty towards work usually outweighs the loyalty for home and family responsibilities (Mellström, 2006). In the initial inquiry we understood most men in our research contexts to be thinking of gender equality as something obvious, although our participants themselves say they do not always practice what they preach. Our respondents claimed to prefer to be present in their children's life, in contrast to being the absent fathers many of them says to have experienced their own fathers to have been. We believe it is important within these contexts to

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discuss masculinities as well as femininities, and in our experience persona Sven has been a valuable tool for such dialogues.

### **4.3 'Switching gender'**

An implication of using the Persona method is that images and representations, such as for example persona Sven, risk presenting gender as unitary categories and thereby risk reproducing gender stereotypes rather than challenging gender inequality. Therefore, we have developed the design method to be a practical tool for communicating and discussing gender blindness within innovation and entrepreneurship systems. With inspiration drawn from the qualitative method of Memory Work (Widerberg, 1999), we have challenged the stereotypical representations by switching gender of the personas. During workshop activities our participants are asked to address the situations presented by the personas and discuss consequences for women and men. Thereafter, the participants are presented with e.g. persona Sven, and a discussion is initiated based on his story. Subsequently, the participants are presented with persona Sara, see below, who is a 'female representation' of persona Sven, and asked to reflect on whether the scenario becomes different due to the switching of gender.



### **“Sara”**

*Figure 5. Illustrating persona Sara used in the Daring Gender project.*

*Photo: Istock*

This is Sara, a thirty-nine-year old associate professor within engineering faculty at the University. She comes from a family of entrepreneurs. Entrepreneurship and commercialization is hence not new for Sara, and within her research team, of fourteen men and one woman, almost everyone has a business on the side or has sold a product. Sara has a large network of companies and board members she meets on regular basis. According to her, *“To be entrepreneurial means to build bridges between academia and society, to find solution in collaboration with industry that meets market needs”*.

Even though the university is promoting entrepreneurship, sometimes Sara experiences entrepreneurship as not being accepted as university activity. Though Sara persists: *“Commercialization of research is important because of its benefits for society. Research is the raw material that needs to be processed and packed by industry. You have to highlight what is valuable and frame it in marketable words- a success can lead to regional development and job creation”*. Her research team is doing very well; they obtain a lot funding and have been able to recruit many doctorate students. However *“It is like it’s dirty to make money on research, but I think it is ok as long as it does not compete with the universities activities”*, says Sara. She thinks academic entrepreneurship is about doing something of value for society, such as developing businesses and new products and considers the social field a bit ‘soft’, not doing ‘real valuable research’.

She has a family, her husband Anders works as a part-time pre-school teacher and they have two children, Johan and William. Sara considers them being quite equal, for example her ambition is to help Anders with e.g. the vacuuming, though Anders usually has finished by the time she gets home. She does not mind; after all she earns most of the money and does something valuable for society, Her husband understands this. Usually Sara spends at least 60 hours at work and in addition works from her home office or is away on business trips. Still, Sara would like to have a bit more ‘quality time’ with her children, she used to play football herself and now her oldest son has started to play as well. Nevertheless, she did actually take parental leave when her youngest son was born, she is quite proud of having worked from home for ten whole days. This is not something the men in her research team have done, and they often make fun of her being so “soft”.

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An experience of 'switching gender' activities is that participants have not initially recognized the story. It usually takes a while before they become aware of the fact that the story is the same, but the gender is different. When presented with persona Sara, the participants have commented that 'she' becomes the only woman working at the department, which contrasts the story from Sven's. Thus, our experience of using Sara is addressing issues such as for example 'tokenism', being one or one of few in a structure dominated by the other gender. According to Kanter (1977), this may result in increased visibility; such as inter alia one woman acts as a stand-in for all women and subsequently performance pressure. Another issue that can be addressed is arguments for the very symbol of an entrepreneur being a man (Ahl, 2004; 2006). An indicative example of this is the resulting identity, expressed by one of our participants as;

"Women at the university often try to defuse differences between women and men and women adapt to men's behaviour in order to be accepted" (Interview in the Daring Gender project)

During our mapping, we identified what could be called a result of this; women do not want to be presented as 'female entrepreneurs' or 'female' whatever the suffix may be, in line with claims of a 'stigmatizing identity' (Ahl, 2004; Lewis, 2006; Fältholm, et al., 2010). Consequently, based on our understanding the strategy for some women is to adopt an identity that suppresses female identifiers and to work harder to prove worthy. Though, a positive effect of being a woman in a male dominated structure may be increased positive attention by people higher up in the hierarchy (Kanter, 1977).

An additional experience of using persona Sara is our participants' comments of Sara's family situation, for example

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the question of why she has children at all if she does not take care of them, an issue that in our experience have not been discussed at all with persona Sven. Our participants consider the scenario unrealistic because of Sara's husband; who is said to work part-time and take care of the home and the children. Apparently this is an issue where gender division is obvious, amongst our participants it is not considered normal that men work part-time and take on main responsibility for home and children. Another thoroughly debated issue is that 'she' has chosen to take only ten days of parental leave. Although Sweden have a very favourable parental leave that both fathers and mothers can use, it is still more common for women to take major part of it. The fact that persona Sara's 'home-service' and her short parental leave often becomes a subject for harsh discussion, which is not the case for persona Sven, reveals a lot of gendered values and norms, both for us and for the participants themselves.

For this reason, we argue that the critical reflections promoted by the switched gender of a persona contribute to a reframing of gender awareness, because our participants reflect on, and recognize, their own – often- stereotypical norms. In our activities, we use 'switched gender personas' to highlight and discuss strategies and consequences within the research contexts. Persona Sara is a character whose story is not based on empirical data. Our experience is however that 'she' becomes a useful tool for challenging gender perspectives amongst our participants and therefore we consider the method to be a contribution to a critical reflection of current gender perspectives.

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## **5 Reflections on a gendered innovative design**

This chapter involves an exploration of our re-designed Persona method for realizing gender theory. In this, the objective is to illustrate our development, experience, and continuous refinement of, the Persona method and its use within collaborative interventions. In our view, the main challenge is to widen perspectives and increase awareness within both institutional and individual arenas of unequal gender orders. Thus, we consider the persona method supports unsettlement of the former stable gender inequality.

In our persona development we are mapping the contexts and subsequently communicate our findings to the actors within by the means of the personas. It is emphasized that awareness only is possible if actors are given the opportunity to distance themselves from the situation and the structures they are in through reflection (Freire, 2000). We consider the Persona method to contribute to the field of applied gender theory with being one way of critically reflecting on situations and structures as proposed by Freire (2000), Schön (1995), and Dewey (1998a; 1998b). In spite of this, it has been noted that in reflection we risk only see a mirror of ourselves and our beliefs, and that reflection, as a critical practice, therefore may not seriously challenge current conceptions (Haraway, 1997). Therefore, we draw inspiration of both Simon's (1996) oft-quoted saying of design dealing with 'what ought to be', and Haraway's (1997) metaphor of 'diffraction', as deliberate interventions aiming at making a difference in the world. Elsewhere, Haraway (1988) calls for an ability to translate knowledge among different

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communities. The Persona method we consider illustrates the possibility of communicating gender theory in a practical, straightforward and visually attractive way that goes beyond that of a spoken or written word. In particular, we believe the switched gender personas to 'mess with' stereotypical gender representations and thereby create an imbalance of stable states. In our experience the Persona method contributes to participants engaging in gender issues, both of present states and future possibilities, people that are not familiar with gender theories at all.

However, we also recognize the implication of reproducing gender stereotypes by using the personas as stand-alone-objects. The personas are presented as either women or men, thus risk reproducing the dichotomy between women and men. But on the other hand we discuss a diversity of masculinities and femininities, which are working in a variety of disciplines doing a multiplicity of tasks. Therefore, our use of the Persona method can be seen as one input to a diversification of gender. We do emphasize, however, that the personas should not be used as single objects, we use them as tools for discussing gender and not as posters on a wall. Each persona is based on thorough background investigation and in-depth discussions during workshops. In our experience the success of using a persona also depends on our ability of being open to new perspectives, of being in resonance with the actors and pick-up on their experiences of gender inequality in structures, interactions, and symbols and the construction of individual identity that follows this. In both projects we have been working in practice-oriented contexts, meaning that participants in the activities have various interests, and most often not have gender equality as first priority. In such constellations, the Persona method seems to

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be a useful tool for communication of gender issues in a visually attractive way, or put differently; a tool that support actor's diffraction and thereby realization of other experienced realities. This can hence be one way of challenging the former stable state of gender inequality; meaning the understanding of alternative ways of doing and interacting gender.

Our findings indicate that as negative attitudes towards gender projects still exist, Personas seems to be a way of 'tricking away' conceptions of gender discussions as threatening, useless and 'feministic', in a negative sense. Using the Persona method can also be seen as a radical innovation in itself, because it is a new application of a design method that in interactions with participants have illustrated to contribute to unsettle stable states (Schön, 1973). It is in our experience also a method that facilitates the analysis of the dynamics of practice and awareness of constructions of both masculinities and femininities in organizations.

However, the challenge is to find a method that contributes to go beyond individualistic and structural explanations and solutions, to imaginations of what could be. An example is to prompt questions of what if gender no longer was an issue, what would the world look like then? Thereby, participants initiate a process of transforming their mind-sets into increased gender awareness. Whereas we do interventions in various constellations, we rarely do follow-up sessions with same participants. For this reason, our interventions can be seen as social innovations or experiments (Jungk, 1987) that contributes to reduction of apprehension of what the world would be like without gender inequality.

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Finally, in this chapter we have elaborated on our experiences of the Persona method as one way to, not only illustrate and discuss gender inequality, but also to actually challenge, provoke, and– in the long run –contribute to promoting change of gender inequality. Consequently, based on our experience, the Persona method contributes to talk beyond that of the ‘problematic women issue’ into issues concerned with both women and men, and thereby shows a way to unsettle unequal gender constructions.

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