

the nordic **textile journal**

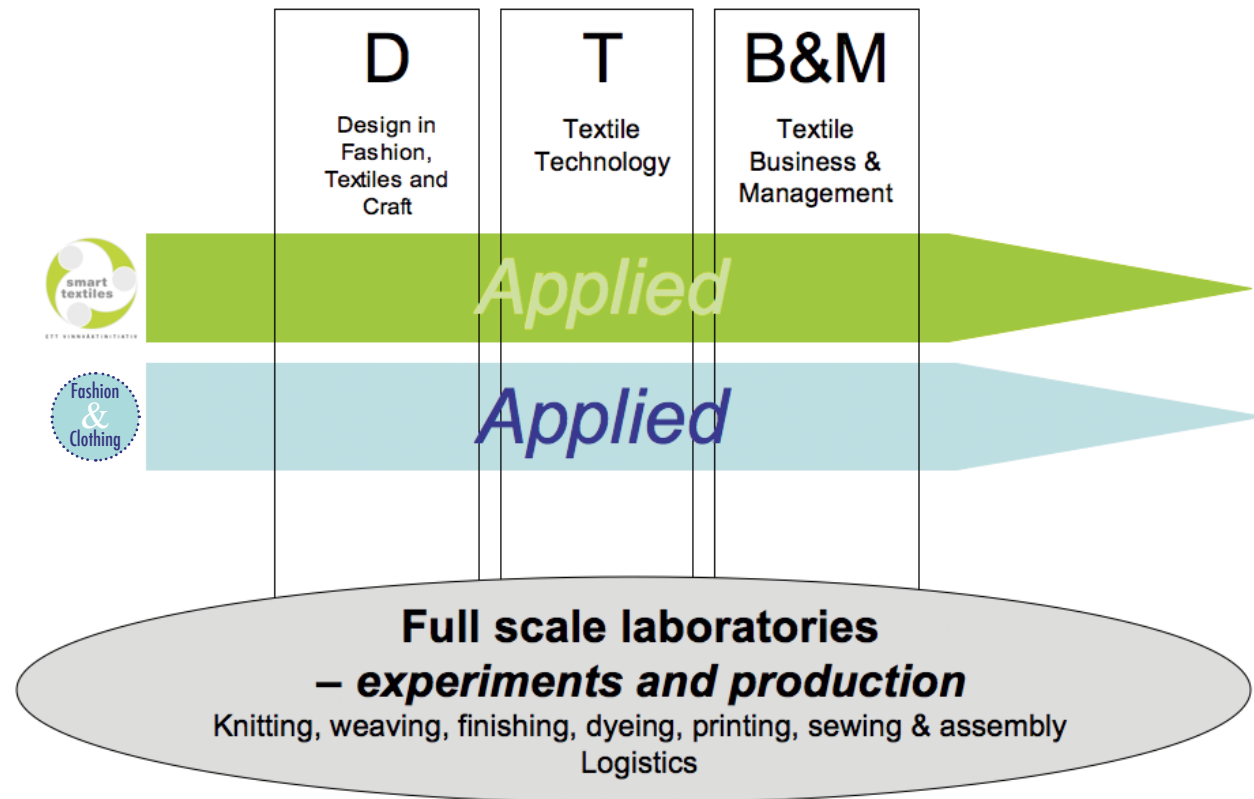
Textile Craft, Textile and Fashion Design, Textile Technology, Textile Management & Fashion Communication



Special Edition: Fashion & Clothing

1/09

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Referring to the overall concept matrix of three cornerstones (Design - Technology - Business & Management) of the Swedish School of Textiles, this means that all aspects of managing this very complex value chain that stretches from “concept to satisfied customer” should be addressed in future development concerning R&D and top notch education programmes. It applies not only to the necessary “core” profession-based skills but also to such related items as fashion communication, graphic design, logistics and demand chain management, fashion curation, etc.

Fashion & Clothing – perspectives of the fashion value chain

Fashion & Clothing will address an overall view of the value chain that consists of all the elements between the anticipated customers’ known or unknown needs for textile related products and the ability of the business concept creators to realize this in the most cost-effective way.

Traditionally, *fashion* is often defined as “the prevailing style or custom, utilizing clothing, accessories and hair to show or hide something about oneself”, but this definition has expanded to make statements about lifestyle, political opinions, class, etc. and is often symbol-intensive. Fashion is an ability to integrate different interests, needs and expectations into textile expressions based on aesthetics, function and economy.

Fashion is deeply integrated into other areas, like home textiles. Walk through any home furnishings floor and you will see some of the greatest names in fashion, such as Calvin Klein, Ralph Lauren, Donna Karan, Zara, Tommy Hilfiger and many more. Cross-concepts between sports and fashion as well as fashion and workwear are rather rule than exception today. *Fashion and function* (-ality) are inseparable, when we talk about this totally globalized industry today and tomorrow.

Fashion and retailing are now integrated from the large chains and brands like H&M and Zara with “flagship stores” to the mutual dependency of retailers and brands, including private brands. *Fashion and distribution* also include development, where distance selling, including traditional mail order as well as web commerce and concepts such as “long tail”, provides examples of cross-disciplinary fields of fashion, distribution and sale.

With *Fashion & Clothing* we intend to participate and influence the future from several textile and fashion aspects, led by the keywords respect, humility and understanding in a sustainable society. Fashion & clothing will combine knowledge and insight into hard values – from the design, artistic and creation perspectives to the customer and business perspectives - and soft values in the form of a sustainable society taking account of health, wellbeing and the environment.

Referring to the overall concept matrix of three corner-stones, design, technology and business & management, of the Swedish School of Textiles, this means that all aspects of managing this very complex value chain that stretches from “concept to satisfied customer” should be addressed in future development concerning R&D and top notch education programmes. It applies not only to the necessary “core” profession-based skills but also to such related items as fashion communication, graphic design, fashion curation and demand chain management.

Fashion & Clothing – a key profile at the Swedish School of Textiles

Fashion companies in Sweden were already in the late sixties among the first in the world to start the globalized build-up of fashion value chains. Taking advantage of this vast experience Swedish fashion companies are among the leading international brands today in the various fields of fashion, sportswear and workwear, with many important players in all categories, including branded manufacturers, branded market actors, branded retailers and distance-selling companies.

What characterizes the development is a high degree of innovation and entrepreneurship, combined with the outcome of a modern infrastructure and vision of fashion. From the knowledge of out-sourcing of production and integration upstream and downstream in the value chain to new forms of distribution and sales, an industry has been created, where the understanding of the whole is necessary, and where both hard and soft values are included. Taking the described background into account, a cross-disciplinary environment has developed at the Swedish School of Textiles at the University of Borås, with the textile value chain as its base. The School has the ambition to be a part of the development of the textile and fashion sector, in collaboration with business, society, institutions and academia, both nationally and internationally. Through its research profiles, Smart Textiles and Fashion Perspectives, the foundation has been laid for shaping the future in a textile and fashion perspective,

honouring *respect*, **humility and understanding** in a **sustainable society**. The Smart Textiles programme was presented in the special edition of the Nordic Textile Journal in 2008. With this issue of the Nordic Textile Journal, we wish to provide an insight into the exciting field of fashion and its value chain and inspire future collaboration in these areas.





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Notes on fashion designers' way of working

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Background

Work processes and methodology in the fashion design field, how to work as a fashion designer, is a central theme in fashion design research at the Swedish School of Textiles. Main challenge is to define basic process models and develop generic methods with a specific focus on tracing central decisions in the fashion design process.

Main objective in one ongoing project¹ has been to describe and analyse central design decision in the fashion design through a series of case studies. We have performed long-term studies at two larger Swedish fashion companies. To complement these studies we have interviewed, actually discussed with, six young Swedish fashion designers about their way of working and how they think about their design process. They all work in companies where they have a crucial influence on the final design of a collection. We have tried to get as close to personal reflection as possible to document practices of design methods. We have chosen the following approach: long discussions have been filmed and then transcribed with only minor text editing. The texts have then been reviewed by the interviewees and just slightly edited. (Lundstedt, Hallnäs, 2008)

This paper presents two of the designers, Ann-Sofie Back and Sandra Backlund, and some significant issues in their working methodology. These two designers work in different ways and provide good examples of the big span in working methods, which of course also relates to differences in final expression.

Photos (Lars Hallnäs) are all from the designers' studios and public fashion shows:

Ann-Sofie Back – design studio in London. Show at the Forum, fashion week in Copenhagen in August 2007,
Sandra Backlund – design studio in Stockholm. Show at Berns, fashion week in Stockholm in January 2008.

¹ Design Rationale in Fashion Design – funded by the Knowledge Foundation/KK-stiftelsen



Sandra Backlund

"I am not going to come up with these ideas in my head, if I just sit and draw. I am only going to do that if I make it with my hands. It has something to do with the brain halves I guess. I cannot imagine these garments that I do. There are so many who have difficulties understanding how I work and how I have come up with the garments. I experimented a lot; I spent a lot of time on that. It is worthwhile also, if you want to get something that is a little unexpected. Then, it is personal, I see I have a personal aesthetic, there is a red thread in what I do, and I make clothes that fit with my personal taste."

Significant for Sandra Backlund's way of working is the design of the design process (cf. Jones 1992 pp. xxvi and Jones 1998) She creates garments and expressions that strongly relate to the specific working methods she has developed during a number of years. It is a matter of the systematics of confidence, to know when the process is right by learning how to work with creativity. To design the design process and be happy about it refers somehow to a feeling of losing oneself in the work.

"I just know when I've found a good shape".





"I just know, I see it when I see it. I cannot think of it before, I cannot draw it; I cannot decide it before. I see it when I see it."



"I work almost always only on the basis of improvisation. It is not that I sit down and think that I should find inspiration, but it may be something that has been a while in my mind, a starting point. It is often very free and nothing that I am strict with. I see it more as a start. It could be the colour or the shape or any other loose idea."

Sandra Backlund includes herself in her work and works with improvisation and composition, training the critical eye that guides intuition (cf. Arnheim 1988 pp. 1-4, 36-50). As Sandra Backlund says "I see it when I see it". You can see her mannequin or body as a white canvas that she paints with her knitted fabric, she sculpts shapes and volume into wearable art.



"Then I get the material and start to improvise with the craftsmanship. I almost always build my clothes, no matter what materials I use, of small pieces; the technique can be compared with collage or sculpture. I never have to go through this process of figuring out how it will work or how to do it. I am very free. Then it is a matter of personal taste when I know, this is good. I do not know exactly how it works but it is what determines how I want it to look like. Try out, try out and try out, I put a lot of time on the pure craftsmanship".



"Then when I have got a few pieces together, I pin them together in different ways, and test how it looks and how I can build forms and use my knitted parts in different ways. I am quite strict. I can say to myself that I only allowed to use these parts. I restrict myself in that freedom, so that the work will not be endless. I can be so strict that even if I see that it would be a better result if I knitted two turns to this piece, I do not allow myself to do it. I am a little bit like that but, I am trying to quit that behaviour, it was a good starting point when I started to design, but there is no reason to compromise on the final product for any kind of geeky matter of principle. I have tried to drop that a bit now."

When Sandra Backlund talks about craft in her work she refers both to techniques and what Jones call a subtle system of efficient work methods. It is design through craft and not design-by-drawing (Jones 1992 pp.15-24). The form is modified by testing, testing – it is sketching and designing by knitting.

“I work with some kind of self-therapy. It sounds very strange but there are quite a lot of artists who work like that, if you write poetry or music or paint or whatever you do. There is a need to express oneself or get things out of you.”



"I know that we all care about what other people think, but somewhere I believe that I am a very introvert person. Although I obviously care about external things, but this way of working is still just a big ego trip. Maybe I need it to deal with myself, I don't know."





Ann-Sofie Back

"We start designing the garments of "Back", by selecting garments that don't feel too rotten to take up again."



"It's a pretty good way to start using the new garment types myself before I start to design the next season, then I can stop using the trench coat and think that I just have to have collarless coats. Then I know how it works.
-You wear it yourself?
Yes exactly, I buy a second hand coat and sew it so that it becomes my own collarless coat, so I do not force a garment type on myself that I don't like."

Ann-Sofie Back often uses already existing clothes or her previous designs as a starting point for the development and design of new collections. It is a certain form of re-design (cf. Hara 2007 pp. 22-25) and a search for design improvements by searching for visual inconsistency (cf. Jones 1992 pp. 209-213), an act of making the known unknown, to see new things in the old ones.

"It is about what you are inspired by in general, I am inspired by the clichés about fashion or beauty, femininity or sexiness, or how women are depicted in media, things that I have a problem with, something that I dislike. For some reason, I feel that it is more interesting and fun, and more to work with, than to be inspired by butterflies that are beautiful as they are. "

"I am personally not so amazingly interested in colour. I usually don't wear any colour, I can only like one colour at a time, and then, I have three garments in that colour, and then, remove them, then I like yellow and then blue. I am not so into colour and form, it doesn't interest me so much, it's the idea, and the cutting of garments, it becomes too much information if I use colour also. I think my ideas work best in a rather neutral material and fairly neutral colours. Gray, beige, brown, black, white, neutral colours."



If you are using political fashion (cf. Breward, 2009) etc., as a starting point, ideas are not coming to you automatically every season. You need methods to find "inspiration". It is here many designers use thematic frameworks for the collection and go into research about colours and trends. Ann-Sofie Back uses scale drawings in a process of design-by-drawing to develop the design, to predict the outcome (cf. Jones, 1992, pp. 20-24, 64-66), but also to communicate with the design and production teams.

" When I start to sketch, I start drawing the idea of the garments or styles that I used last season, I usually do not renew myself. It is often then I realize that if the trench coat is still a trend, or if it is men's shirts or blouses, or if it is more feminine. Then I try to force myself to change styles. "



"The sketch is just so-so, well, it is not fashion drawings we are doing, it is more so-so."



“...I have already gone through that, because I have already sketched 40 variations on the idea ... and then I selected 3 out that I think would work. So when we start with the pattern, I know if it is possible or not.”



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Michelangelo Pistoletto, Venus of Rags, 1967

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The function of fashion? The design of new styles... of thought

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Premise

I don't know if we are all aware of the fact that joining the ongoing academic discourse about the "Function of Fashion" means being ready to open a Pandora's box full of questions such as: How do we define the function of Fashion in current society? Is Fashion utilitarian? Does Fashion inform society's attitudes and behaviour or does Fashion just mirror the *zeitgeist*, the spirit of the times? What is the semiotic function of Fashion within society? Is the function of Fashion the creation of hierarchical and/or competitive signs functional to the market economy? Has Fashion to be just seductive? Is Fashion the fabrication of art, pleasure, or entertainment? Is Fashion Design equal to Design and if so, what is Design? How do we define Design?... and the list of self-revolving questions could go on for pages. As you see, the in-built risk of research is that of creating perpetual machines of never ending theoretical questioning. This process is of course very necessary and very fruitful for the construction of academic knowledge about design and research activities, but does not really respond to one of the main 'functions' of knowledge that - especially in crisis ridden times as ours - I consider to be dramatically urgent and imperative: the design of (aesth) ethical models for sustainable growth and new prosperity.

Research, or better said, design researchers are today asked to roll-up their sleeves, suspend their arguments about “form follows function” (Sullivan, 1896) rather than “form follows fiction” (Deitch, 2001) and go for “**FORM FOLLOWS FACTION**”, the new dictum of the new modernity, where

*“new modernity is understood to be an unsentimental but humanistic acceptance of the state of the world - a clear-eyed engagement with the recent radical changes in human interaction, access to information, awareness of catastrophic problems, that is combined with deep personal commitments to hope, passion, and the belief that it is possible for humanity to live in a new way. Further, if faction is understood to mean a group of people who express a shared belief or opinion, and if its Latin root word, factum, is understood to mean an objective consensus on an aspect of reality, then the expression form follows faction perfectly summarizes all of the various innovative and humanistic creative responses the new modernity of 21st century.”*¹

Furthermore, the Latin word *factum* also means something done, enterprise, and last but not least business. Shortly said: this is a call for sharing our ideas, taking a stance and going for action. And for doing that, we can start from here and now. We can start from Fashion of course.

Our most urgent task: designing alternatives

Let’s get one thing straight: if there is a chance to find a way-out from our global emergency, that depends on cultural players – like all of us – willing to contribute with the design of alternatives to the actual (and deeply damaged) system. We urgently need the design of new economic, political and above all cultural models that can take up, that can deeply change businesses’, politicians’ and people’s attitudes, thinking styles and behaviours. In the absence of alternatives - for which the time is ripe

¹ David Goldsmith, Masterstudent at The Swedish School of Textiles 2009

- an unsustainable situation can drag on and collapse seemingly forever. History offers instances of many socio-economic regimes that were collapsing and disappearing forever (Diamond, 2004).

The shift from a black outfit to a black outlook

Black seems to be the color of our prosperity outlook not only across Europe’s and the USA’s economies but worldwide today. Macroeconomists, governments and the media tell us that the global GDP is endangered as never before. “Growth isn’t growing” and nobody knows if and when it will start growing again. And this threatening news got us while we were still under shock because of the results of the Stern Report (2006), the IPCC UN scientists outcomes (2007), the UN-Nature Conservation Body research (2008), just to mention few of the studies, that respectively told us that, yes, climate change is happening and it is anthropogenic in its nature, meaning that it is essentially caused by human interference; that the costs of climate change would amount to as much as 20 percent of the global GDP if we don’t commence immediate countermeasures; and that we are already loosing two to five billion dollars in the form of natural capital every year.

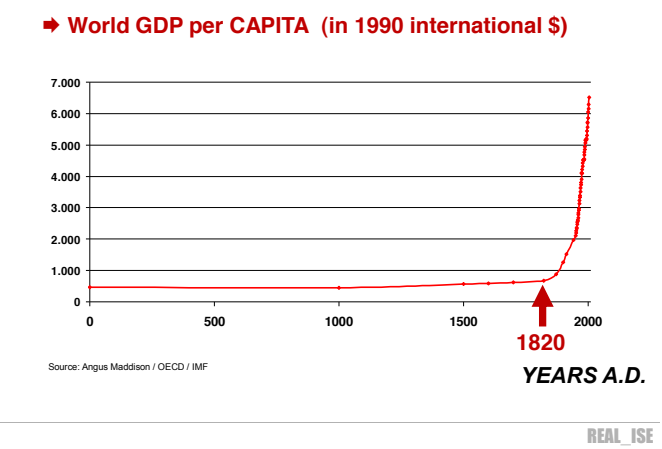
The end of the beginning?

Is this just a temporary stormy condition, or the “end of the beginning” of a worldwide catastrophe? Catastrophes are of course catastrophic only for transient life on this planet – like human beings, because our planet Earth, unlike us, is the product of as many as five billion years of natural catastrophes. In fact, the environmental pressure that we have been imposing on the planet over the last two-three hundred years represents just one of its many disasters. But for most life forms that inhabit our planet, including the human race, it’s a matter of life and death (Lovelock, 2009). For us, human beings, this is an existential problem. Gaia, together with her gods and demons, is looking on and leaving us to get on with our self-made catastrophe. Our

pretty blue planet will continue along its path through the universe with or without us. It will survive with or without *homo sapiens sapiens* and our wonderful inventions such as art, science, technology; with or without that special creature that invented music, philosophy, and discovered X-rays and vaccines; with or without that same humanity that created morality, but also war...that humanity that made history.

From *homo habilis* to ...*homo modernicus*

A history that describes how mankind, slowly and gradually at first and then, with rocket-like acceleration, has managed to exponentially increase its population and its productive power. When we follow the development of economic achievements of mankind then we have to notice that there was not much happening for millions of years. It was only at the beginning of the 19th century that the gross domestic product of certain countries literally took off (Maddison, 2001).



This enormous growth spurt which is actually still going on, indicates that at that time, after the *homo habilis*, the *homo erectus*, the *homo sapiens* and the *homo sapiens sapiens*, a new type of human being was born: the *homo modernicus*.

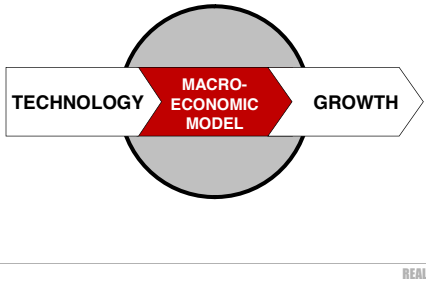
Our *homo modernicus* is a European offspring, a rationally-thinking offspring of the Enlightenment. He is a free and democratic Man, who shows his solidarity with others and is guided by the values of the French Revolution. He is an ingenious being who made the Industrial Revolution. He is a pragmatic Man, who grasps the economic dimensions of consumption economy. And finally, this *homo modernicus* is also an exuberant Man, who not only threw himself -with all the exuberance of an youngster- into the globalization project in order to be able to keep up with the exponential trend of economic growth at compound annual growth rates. But he also went beyond his goal of harvesting the profit of the real economy and launched himself into the hazard of the speculative financial markets (Carbonaro ; Votava, 2008).

The neoclassical model of growth

According to general economic knowledge, the economic growth of the modern age, which has kept up for nearly two centuries now, is a factor touching on selfsupporting processes, which are based on two main tenets: With regard to the supply side, growth made it possible to invest in research and development which produced significant technological innovations until now. This led to new products and more efficient production processes which, in and of themselves, reinforced further growth. That is why productivity today is 20 times that of 1820. In the eyes of economists technology is thus the true driving force of growth. They rely on technological progress to solve the repercussions of any environmental pressure and do not see any incompatibility between economic growth and environmental protection.

On the demand side, growth created an extraordinary improvement in the standard of living in the industrialised countries and led to the development of our present consumer society, which is itself an important mainspring of growth. For traditional economists our concept of well-being, as well as the social, civil and cultural development of societies, is therefore tightly linked to economic growth (Sollow, 2007). But this neoclassical

growth theory provides neither details about the social impact of economic prerequisites on technological progress, nor does it tell us anything about the duration of the transitional state. Like most economic theories, it is based on a very simplified model, which describes the consequences of an input parameter like technological progress for example, on the output parameter, which is defined by the model, as for instance the GDP growth index. For this, *ceteris paribus* conditions are assumed – which means that one thus assumes that all other parameters remain unchanged.



Today, macroeconomics is still unable to describe the effect of several determining factors which are interacting with each other on complex and interlinked systems like our economy, our societies, our cultures and our environment. Nor can it make statements about the reaction time to modifying impulses within such systems. That is why we must be very much aware of the fact that we have entered into the adventure of deregulation, liberalization and globalization with a stirring declaration of faith but without any rudder. We were, we are, navigating only by sight!

GDP and GNP straight jackets

In 1968 Robert Kennedy, in a speech he gave during the primaries of a US election campaign, was already questioning the GNP as a suitable economic indicator of prosperity when he said: "...Our gross national product counts air pollution and cigarette advertising, and

ambulances to clear our highways of carnage. It counts special locks for our doors and the jails for those who break them. It counts napalm and the cost of a nuclear warhead...It counts television programs which glorify violence in order to sell toys to our children... Yet the gross national product... does not include the beauty of our poetry... the intelligence of our public debate... It measures everything, in short, except that which makes life worthwhile..."

To date, and in spite of that prophetic warning, more than 30 different indicators have been developed in which the subject of prosperity has been assessed in different ways. One of the most interesting one is the Index of Sustainable Economic Welfare (which later evolved into the Genuine Progressive Index) because, for the first time, this indicator made it possible to make an actual comparison between economic growth and prosperity. This comparison proves that economic growth in all the industrialized countries has indeed generated prosperity, although with a steadily decreasing force. Prosperity growth began to stagnate in the US from the 1960s onward, and in the 1980s growth even became negative in the remaining OECD countries (Daly ; Cobb,1989). Despite some criticisms that could be made with regard to the Index of Sustainable Economic Welfare methods, people today would largely agree that a steadily growing portion of the GDP consists of the repair and maintenance of our society.

The discrepancy between wealth and happiness

It will come as no surprise that the equation linking economic growth and public happiness has today being repealed – not by moralists or anti-capitalist activists – but by liberal economists such as Lord Richard Layard. There is scientific proof that – in economically developed countries - the tensions caused by material wealth worsen with the increase of economic growth.

According to the findings of the psychologist and Nobel laureate Daniel Kahneman (2003), in our western societies, people's aspirations are presently moving from an economy striving for material wealth to an economy striving for well-being and happiness. In such an economy, those goods that are valued most highly only have a significance within communities and are not exchangeable, cannot be reproduced or cannot be replaced by others, like for example security, peace, friendship, time, culture, knowledge or simply truthfulness and honesty. These socio-cultural factors, which form the bases of what people's aspirations are made of and that could be the platform of our future economy, have not really been taken into consideration in macro-economics to date.

It is only recently that some politicians have also come to understand that today, the gross domestic product cannot be an indicator of prosperity any longer. At the beginning of this year, as an example, the French President Nicolas Sarkozy surprisingly commissioned Josef Stieglitz and Amartya Sen, the Nobel Price Laureates in Economics, to propose new indicators for the quality of life and for sustainable economic development by April 2009.

Technology as the driven force of growth?

We should not only question if and how economic growth is really contributing to our well-being and happiness today, we should also take a much closer look at the concept of technology as the driving force of growth and progress.

On one hand it's true that technology has already proven many catastrophic predictions wrong. In the past, for example, we thought demographic growth was going to throw us back into the dark ages, but increases in agricultural productivity have managed to solve the problem. Too bad that this same technological "solution" is also one of the factors that increases environmental pressure and will eventually create the next generation of problems.

The perpetual machine of natural capitalism

The advocates of "natural capitalism" (Daly, 1991) claim that if technological progress could provide enough free energy by exploiting all forms of renewable resources, then we will have achieved heaven on earth. We would have built up a kind of perpetual production machine, a happy, everlasting world, fueled by all kind of renewable resources. It is a world where the economy is in perfect harmony with all ecosystems, a world in tune with all imaginable consumerist lifestyles and a world in which we no longer need to question either our economic system, nor the quantity of material "things" that we need to need for our pursuit of happiness.

Let us imagine for just a second that this vision can come true right after we will have fixed our actual global economic crisis, before climate change becomes irreversible and before we run out of fossil fuels. Let us envision a world of tomorrow in which the development of a "cradle-to-cradle" design system, based on the precept that there is no real end for any object we manufacture, just "reincarnation" (Braungart, 2003), together with an endless availability of energy, an unlimited access to resources, would make the unlimited production of material things feasible.

I think that even if this were to happen, we would still end up "hitting the wall" simply because the infinite growth of material "things" would be unsustainable and incompatible with our ways of life and the meaning of life.

Time and space are non-renewable resources

The fact is that we cannot just consider our physical environment and our material world. We also need to take into account our *habitat*, and our habits, meaning the totality of our living space and of our life-styles in which the psychological dimension of the quality of our existential space and time occupy a central position. Our space and our time are also limited (Virilio, 2008) and they are also - in some sense - non-renewable resources. They should thus be handled with care and be an

integral component of our deliberations on economic development and environmental pressure. The issue of sustainable growth certainly implies a technological challenge, but also an anthropological one, meaning a cultural concern. And both of these facets of growth are closely correlated to each other and have to be viewed on equal terms.

People on the two sides of our planet

It is of course true that people respond very differently to the economic and environmental pressures they are exposed to, depending on where they live. On the other side of our planet we have new hopes for prosperity and for the achievement of a Western life-style – a hope that might start to collapse due to the repercussions of our western economic crunch (20 million Chinese laid-off factory workers have already migrated back to their native villages).

On this side of our planet we see the end of the dream of constantly growing material prosperity. This was the dream of Mr. And Mrs. Everyman when they were – quite recently – still identifying themselves as members of an increasingly wealthy middle class. For them, the Damocles sword of a next energy crisis and the soaring costs of basic foods, of their children's education, of health and assistance, have become a serious problem.

They do not care about whether prosperity is measured by one index or another. They only notice that the bursting of the speculative bubbles has also left deep holes in their own pockets and that in the meantime, planet Earth has become as small as their own flat and suddenly, everything is somehow interconnected.

They have understood that the two giants, China and India, have awakened and are hoovering up energy, raw materials and jobs by manufacturing cheap products for the whole world. And their employer's "headcount reduction measures" showed them very clearly just how much these foreign cheap articles production sites impact the domestic industry. And by the same token has shown

how much we also depend on the prosperity of those "fast developing countries" for the export of what we still produce in our countries.

The change in Western consumers' behaviour

Thus the life of Mr. And Mrs. Everyman has changed all of a sudden and quite unexpectedly. Concerns about their standard of living, their pensions and their jobs are added to private crises which are accelerated by the decline of the traditional family model and the dissolution of obsolete gender roles.

In view of the economic, social and environmental turbulences of our time, our previous life style, aimed at material, ephemerally hedonistic and irrationally entertaining consumption, can no longer provide the security they desperately need today. What was so self-evident until recently, now seems remarkably unreasonable.

We should thus not be astonished that consumers have become more shopping reluctant. It is as if, after all of the hullabaloo of too much, too many, too tempting "offers, bargains, points-of-sale and advertising messages" aiming always and exclusively at their purse while making use of the most extravagant marketing means, that consumers are now asking for a time-out. They are less and less impressed by the advertising campaigns and turn their attention increasingly to the cost-benefit ratio of what they eventually still buy. That is why they flock to discount shops, into factory outlets of all kinds and their only new form of luxury is to treat themselves with a private item, a little something that is very special and unique, clean, fair, good... something that makes sense and is able to tell the story of its tradition and origin.

The last act of the odyssey of our consumption economies has begun: Ulysses returns to Ithaca. As Ulysses did after his long wandering, people too, after all the deceptions, the disappointments and transient seductions, are searching for tranquillity, the sense of a safe harbour today. They have lost their faith in the myth of possession,

of the "must-have" and are yearning for values which are not only added, but intrinsic and linked to another basic human need, namely the need to grow, the need to invent oneself again and again. However, only *those* things that have meaning to us broaden our horizon and stimulate us to keep on rising above our own personal limits (Weber, 1922).

From a "culture of economy" to an "economy of culture"

I'm not talking here of the so called "Economy of Creativity" announced by Richard Florida (2002). And I'm not talking about Design or Art as strategic tools for differentiating new mass-market products in a global landscape already drowning in commodities. No. Here, I am talking about the need of an economy of balanced material growth on the one hand, and an economy of culture on the other hand, one that implies the advancement of science and art, the expansion of knowledge and experience and last but not least the redesign of educational programmes that break down the barriers between disciplines (Morin, 1999).

It is that kind of cultural development that is necessary for transforming all our products into symbolic and cultural means. Such a paradigm-shift requires a deep cultural and social transformation: from the actual culture of economy driven by the mythology of quantity, mass consumption based on mass-production and the promise of an opulent society focused on the possession of ephemeral things to a new economy of culture based on quality good works, good products, good services. Sustainable of course, but also beautiful, and meaningful.

And a new economy of culture in which culture is not an abstract term, but it is a network of cultural actors that can generate and diffuse not only a new economy producing art, information, communication and education, but also the design of social innovation.

The design of social innovation

People are in fact not waiting for macroeconomist and world politicians to fix the problem of our crises ridden economies. People are already doing their part. They want to make sense, to make a difference. Individuals are already starting to explore new systems to work and live together in a more meaningful and sustainable way. They are starting to organize their own lives differently. They act. They show by doing that there are other ways to live a good life without at the same time threatening nature, other people, or their own inner peace. They are organizing themselves in time banks, home nursery, playgroups, car-sharing networks, producer markets retailing, ethical purchasing groups, community supported agriculture, self-help groups for the elderly, shared gardens, vegetable gardens in parks, eco-sustainable villages, local food catering, co-housing, neighborhood self management, local micro logistics, neighborhood laundrettes & restaurants, 0 Km food services, tool exchange workshops, book exchange libraries, second hand fashion ateliers, and apparel swap groups.



Customized T-shirt at www.realiteewear.com



People creating second hand fashion ateliers - Emude -
"Creative communities". PoliDesign, 2007.

and bottom-up-driven models of designing prosperity in times of adversities have been the object of investigation and cooperation of a new generation of scholars, designers and artists – like the group of Ezio Manzini of the Polytechnic University in Milan or the one lead by John Thackara in the UK. The cultural leaders and the creatives engaged in the design of a social innovation give to policy makers an opportunity to learn from their common success factors and to be alerted to common obstacles they encounter. They can help to develop, initiate and test new policies, aimed at enabling and empowering individuals or “creative communities” to do better and to do more. By exploring new structures of civil society they are also setting the conditions for replication of projects of sustainable lifestyles. By understanding the existential anthropological motivations linked to people’s new behaviors they can also alert and advise the operators of the consumer goods industry and service about new sustainable and meaningful life models, and therefore about the design of new processes, new product and service ideas for which latent needs exist (Meroni, 2007).

The long tail of bottom-up prosperity

What we also already see happening is that many creative individuals or communities are already transforming themselves into sustainable entrepreneurs of excellent uniqueness. Seen from an economic point of view, the entire range of this new generation of artisanal niche suppliers will not only become more significant in terms of turnover, they will also become an important motor of employment for our post-industrial societies, especially because their business model is NOT oriented towards the use of economies of scale.

However, we cannot allow ourselves to envision the production facilities of these new niche suppliers only as romantic arts and craft facilities without any kind of technology. On the contrary! These new producers, in spite of the fact that they regard themselves as enlightened craftsmen and their craft also as an art, have

become real experts in the employment and use of small, flexible and high-tech machinery, which has meanwhile become accessible and affordable for every DIY amateur. And, like every good artist, they know how to sell themselves. They make contracts with local retailers and even department stores, which are beginning to open up for such niche products, because they have understood the importance of including excellence in their own range of products. But they use the internet – and its viral power – as their preferred sales and – above all – communications channel. They are masters of the art of mouth-to-mouth propaganda using twitter, blogs and video blogs and make sure that people are able to discuss their products, works and principles in specifically themed forums. As Chris Anderson has highlighted in his book “The Long Tail”(2007), the internet is an integrated component of the niche provider’s business strategy because it turns masses of markets into a virtual mass market for products that are either unique or of excellent quality.

Redesigning our next culture of consumption

What would thus become the focal point of the new economy of culture is thus a culture that does not seek to renounce material wealth, but redesigns a balance between our unsustainable way of consuming and a fair and equitable distribution of wealth in the world. It is a culture that puts our unreasonable lifestyles under scrutiny of course, but without demonizing material goods *tout-court*, is instead questioning the meaning of what we do. It is a culture that can change on the parallel unreasonable habits of our private every-day life as well as in our actual senseless production methods, by transmitting the intangible yet priceless worth of our vital resources. And it is a culture that frees itself from the dictatorship of differentiation and the always changing consumption-driven Western lifestyles *fictionary* (Baudrillard, 2005), by showing us the unknown gain of diversity and suggesting new models of a good life based on the richness of our cultural diversities.

In brief: It is a culture that – by challenging the zeitgeist – spreads the seeds of a new prosperity and a new faith in the future. A culture that reconciles the vision of the world we are living in with the planet we are living on.

The design of a cultural epoch-making transformation

Those who simply claim that such a transformation is impossible should first ask themselves and then tell us if the current dogma of senseless growth still carries within it the seed of well-being and faith in the future. If the answer is negative, one has to imagine some new course of action. History has already witnessed some cultural and social movements that have dramatically changed the stream of time like Christianity, the Renaissance or the Enlightenment (Ruffolo, 2008). All transformation emerges from that which distinguishes our species from all others: our human mind and spirit.

The transformation towards an economy of significance and meaningfulness would thus require that philosophers besides dealing with ontological dilemmas start highlighting the relevant questions about the meaning of a good life and the set of values and principles we can share for re-designing a good and responsible life: economists must reconsider their discipline as part of the social sciences and therefore stop applying simplistic models of growth and start designing an economy based on a model of balanced, fair and sustainable prosperity; sociologists must stop writing up their market research and start understanding the driving forces of humanity. And last but not least, artists and designers and fashion designers must apply their skills to giving shape, colour, taste and smell to new visions of (aesth)ethical and sustainable prosperity in such an inspiring way that it has the power to challenge the mainstream culture.

Banksy graffiti



Artists/designers/fashion designer as “change agents”

As a matter of fact, in the construction of such an “economy of significance and meaningfulness”, designers and artists are asked to use their creativity to provoke public opinion, to spark public imagination through their interpretations of what a good, clean and fair culture of living would look and feel like for the people of this planet.

In this new economy designers and artists have a tremendously political role, since they – and not the technocrats – can really involve people emotionally and provide models to help us all re-imagine the future. They are the ones that can help us to give shape to our visions and hopes. A future of happiness of course, but this time it certainly will be a more sober happiness.

Many people today speak of the meaning of art and also of design in the creation of a more sustainable growth (ECP, 2006). But so far no one understands how to really unlock the potential of these disciplines. In the consumer goods industry, designers and, in recent times, also artists are regarded as fulfilling strictly a pure marketing function and are not employed as “change agents” or as communicators of the new latent needs of people for a sustainable and better life, which is why most of them do not entirely understand the subject of sustainability, let alone how to implement such a thing.

The “sustainability thing”

The result of this is that the confusion on our markets and in our civil society about “the sustainability thing” is tending to increase and that there is virtually no way that any vision for cultural transformation can be envisioned. We are almost drowning in an ocean of do-good fashion design products and fashion design textiles or clothing labelled as sustainable because they are either organic, or fair, or ethical or vegan, or green or ecological.

I am not going to talk about the differences between ecological and eco-friendly, between organic and green,

between ethical and fair trade. I just want to point out that all these terms are generally put in the same bucket of sustainability that has become a fashionable catch phrase of our time. To most people, sustainability is not just associated with something durable and good for the environment, but has also tended to be associated with some kind of denial and not with cultural and esthetical values that would make this objective emotionally attractive and worth striving for.

Three pillars (without culture) can not sustain sustainability

We all know that the challenge of three pillars model of sustainability implies a equally balanced ecological, economic and social commitment. But all that is not enough. It is necessary but not sufficient, because people today call for much more than just products that will save their world, their wallets or their peace of conscience. They are looking for cultural messages that also can deliver a clue for the “ecology of their mind” (Bateson, 1973). Cultural productions and goods that express their stance through a powerful aesthetic impact. That means everything that embodies strong cultural messages that can reconcile them with a future they thought they had lost.

Who else but artists, designers, and fashion designers would be able to merge all three aspects of sustainability with a poetic and daring gesture!? And who else but they could give us a tangible and understandable sign of a social change that is underway right now? Design is not just the discipline of giving shape to either functional or trendy and seductive artefacts. It is a discipline that can consciously transmit these “low-level signals” of our societies and it is a discipline that can advance, challenge and stimulate us at the same time in that it gives shape to “the new”. Let me take the example of fashion design to clarify how design can be a highly sensitive seismograph of socio-cultural changes as well as the stimulus for cultural transformation.

When fashion design was a driving force of change

For those who can think back that far - It was at the beginning of the 1970's: Vivienne Westwood entered the scene with her rebel fashion creations, expressing the spirit of a new generation of young people and supporting their anti-establishment cultural revolution. And in the late 70's, Armani was not just inventing prêt-a-porter. He was much more designing the new, emancipated and possibly also post-feministic woman, who strode with head held high into a working world largely occupied by men and masculinity. In the 80's Katharine Hamnett was the first fashion designer who designed wearable politics. She was the first designer who used t-shirts as billboards for spreading awareness about the un-ecological and un-ethical criteria of textile and apparel industrial production. In the 90's the trained sociologist and political scientist Miuccia Prada was then creating the intelligent, educated and thoughtful woman, a woman who displayed her femininity in a minimalistic and understated way, which was in contrast to the cynical, opulent yuppie style of those times. Finally, at the end of the 90's Dolce and Gabbana's fashion message captured the secret need of women to reclaim their sensual, warm and prosperous femininity and released them from the anorexic and androgynous patterns that dominated fashion.

These kinds of designers were certainly not changing the course of consumerism history (today most of them represent exactly the opposite: the old luxury status quo), but they wrote history for the way they managed to capture and mirror in their fashion design the most relevant emergent signals of the socio-cultural transformation of Western societies in the last century's decades.



Katharine Hamnet Save the Future campaign

And Today?

Under the technocratic and short-sighted direction of the marketing departments, today's fashion and apparel industry finds itself the prisoner of the marketing strategy of "mass prestige" also referred as "masstige". This strategy means bringing past dreams of luxury to the masses and, in particular, to the many newly affluent people of the emerging countries. Revitalizing old fashion does not require much sensitivity nor originality. As a consequence fashion designers have lost sight of their artistic creative talent and the apparel industry has lost its reservoir of cultural messages to be transferred into the mainstream product offer.

Today, everyone is just copying everyone else. Zara's designers copy Armani and Chanel, the new hordes of Chinese designers copy H&M and the luxury brands copy old Asian and Chinese heritage and transform it into a trendy exotic fashionism. And by so doing, fashion has just become fashion and repetitively refers to itself instead of nourishing our cultures and contributing to the evolution of our civilizations. Fashion has been losing its strong symbolism, its systems of signs and signifiers, its meaning and its messages. Miles of cloth are getting swallowed up by the rhetoric of fashion emptiness. And Fashion is starting to go out of Fashion at rocket speed.

But this could also be a tremendous chance for a restart!

The design of a practical utopia

Allow me to indulge here in a last personal note. In 1933 Keynes said, "The decadent international but individualistic capitalism, in the hands of which we found ourselves after the war, is not a success. It is not intelligent, it is not beautiful, it is not just, it is not virtuous – and it doesn't deliver the goods. In short we dislike it, and we are beginning to despise it. But when we wonder what to put in its place, we are extremely perplexed." (Keynes, 1933)

I believe the same. Certainly any kind of "decadent" capitalism will end, some day, like all historical formations. But hopefully only once we will have been able to create those economic, political, and above all cultural alternative models that will allow us to keep on progress and prosper. In the absence of those alternatives the color of our future, as I said at the beginning, is black.

What is needed is not just a good show, but constructive work on a project, the practical utopia of the design of a new prosperity. What I have in mind is a sustainable, fair and enlightened new culture of economy, based on a capitalist entrepreneurship that is not coextensive with accumulation for profit, but consists of great, creative enterprises, luminous instances of which we have had so many in our Western countries, as elsewhere.

The ultimate task of the next generations – starting now, with our present generations – is to break the economy out of this petrifying mold of interminable, unlimited material growth and senseless wealth accumulation and turn its vital force to the pursuit of a responsible and sober happiness based on quality: real quality that truly counts toward better life and impels the growth of culture, education, the arts, science, knowledge craftsmanship, experience, and last but not least wisdom. By transcending itself, capitalism could most probably count on centuries and centuries more, because it will enter the last growth phase of the consumer economy, the one of an economy of culture, which is the only economy that allows for unlimited growth.

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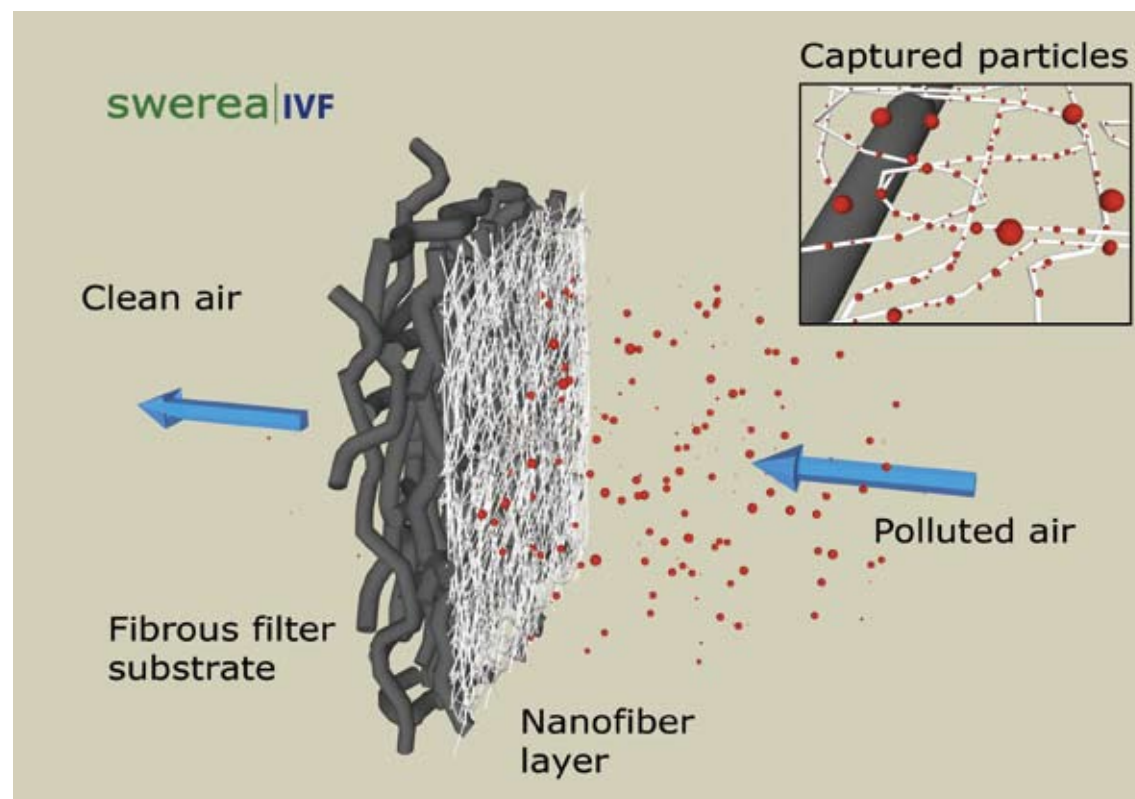


Figure 1. Schematic illustration of nanofiber air filtration. Air polluted with small particles which are efficiently stopped due to the large surface area of the nanofiber layer. Inset: Particles that are much smaller than the pores of the filter are attracted to and captured on the surface of the fibers.

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Nanofibers – small fibers with big potential

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Introduction

Nanofibers prepared by electrospinning are polymer filaments with diameters ranging from several micrometers to a few nanometers. The thin diameters of such fibers give them a very high surface-to-volume ratio, a property that makes them ideal for producing very porous materials with a number of potential application areas.

In lab-scale electrospinning, a polymer solution is typically placed in a syringe and subjected to a strong electric field between the needle tip and a collector. If the electric field strength is sufficient, it will deform the pendant drop at the tip of the needle enough to eject a jet of solution which will travel towards the collector. On its way towards the collector, the jet will stretch immensely. Simultaneously, the solvent will evaporate, leaving a porous nonwoven sheet of very thin polymer fibers on the collector surface.

A broad division of the application areas for nanofibers is Bioengineering, Environmental Engineering & Biotechnology, Energy & Electronics, and Defense & Security.¹ To review all of these areas would be a vast undertaking that could fill a complete journal issue of its own. This report will give an introduction to the research on nanofibers in technical textile applications, which are part of the work at Swerea IVF, namely nanofibers in air filtration, sound absorption, tissue engineering, and wound care. A separate article will describe our research on large-scale production of nanofibers.

Nanofibers in air filtration

Air filters are commonly misunderstood as functioning solely by sieving particles from the air stream. However, the sieving mechanism is only one of several mechanisms involved in the capturing of particles from the air stream. In fact, particles that are much smaller than the pores of the filter are captured on the surface of fibers as shown in the inset in Figure 1.

For nanometer-scale fibers, the air velocity at the fiber surface is not zero which causes the air to “slip” at the fiber surface. This effect decreases the drag force on each fiber, which in turn lowers the pressure drop over the filter. Furthermore, the slip flow makes the portion of air passing near the fiber surface large, resulting in more particles passing near the fiber surface and thus to be captured. In other words, the nanofibers increase the efficiency of the air filter without requiring more energy for pushing the air through the filter. Diagram 1 below shows this increased efficiency for a filter substrate (class F5) covered with nanofibers.

As can be seen in Diagram 1, a nanofiber layer (~1 g/m², blue curve) increases the particle retention efficiency of an F5 substrate (pink curve) to a level that surpasses a filter of class F9 (red curve). Still, the pressure drop is merely increased from 44 Pa to 84 Pa, which is only half of the pressure drop for the corresponding F9 substrate (164 Pa). Obviously, the possibility of increasing filter efficiency in this way could be of enormous benefit for the society. Today, research in this area is focused on the development of large-scale production of nanofibers and ways to overcome the low mechanical strength of the nanofibers. Another issue is the adhesion of the nanofibers to the substrate which is often insufficient for many filter applications.

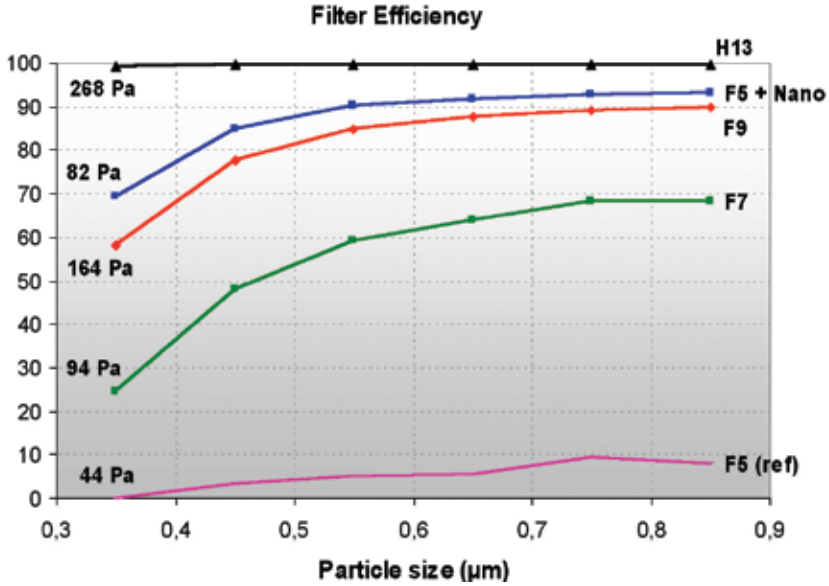


Diagram 1. Particle retention and pressure drops for various filter substrates. F5 (ref), F7 and F9 = Filter substrates of filter class F5, F7, and F9 respectively; F5 + Nano = filter substrate of filter class F5 with a layer of nanofibers; H13 = filter substrate of class HEPA 13 (high efficiency particulate air [filter]).

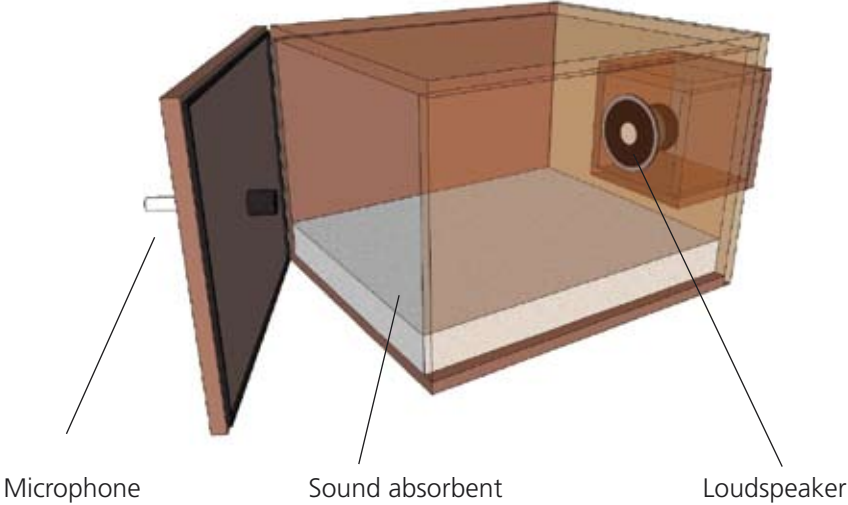


Figure 2. Analysis equipment constructed for quick and cheap qualitative evaluation of sound absorbing properties for thermobonded nonwovens (as shown) and woven fabrics (measured when hanging on a metal rod).

Nanofibers in sound absorption

Environmental noise from sources such as traffic, industries, construction and public work, as well as noise from indoor sources like ventilation systems and office machines, is an ever growing problem to human health. Not only can noise cause hearing impairment, sleeping disorder and stress, it can also reduce learning ability and performance capacity. One way of dealing with this problem is to use sound absorbents near the source of noise or in the premises where people reside in order to create a suitable acoustic environment. Research has shown that nanofibers have very attractive sound absorption properties. Sound absorbents based on nanofibers can have a higher absorption factor compared to traditional absorbents. However, the acoustic mechanism responsible for this effect is not fully understood. During 2008, Swerea IVF administered a project in collaboration with three Swedish companies to investigate the use of nanofibers in sound absorbents. The aim of the project was to enhance the companies’ existing sound absorbents (thermobonded nonwovens or woven fabrics) by integration with electrospun nanofibers. In this project, a tool was needed to determine what properties of existing absorbents would be appropriate for use in conjunction with nanofibers. Therefore, customized analysis equipment was constructed as shown in Figure 2.

This equipment provided a quick and cheap method for selecting suitable absorbents for nanofiber deposition. In each measurement a loudspeaker connected to an mp3-player played 50 seconds of white noise. Simultaneously, a microphone connected to a sound card and a computer recorded the sound. Different absorbents were compared qualitatively by comparing the difference in sound pressure level within the empty box and the corresponding level with an absorbent placed inside the box (see Figure 2). Further analyses of the acoustical characteristics for these absorbents were performed according to standardized procedure at SP Technical Research Institute of Sweden. Diagram 2 shows typical measurement results obtained from the analysis equipment that was constructed within the project. A good sound absorbent will lower the sound pressure level and thus show large negative numbers. A thermobonded nonwoven material covered with a layer of nanofibers curve below the corresponding curve for a substrate without nanofibers.

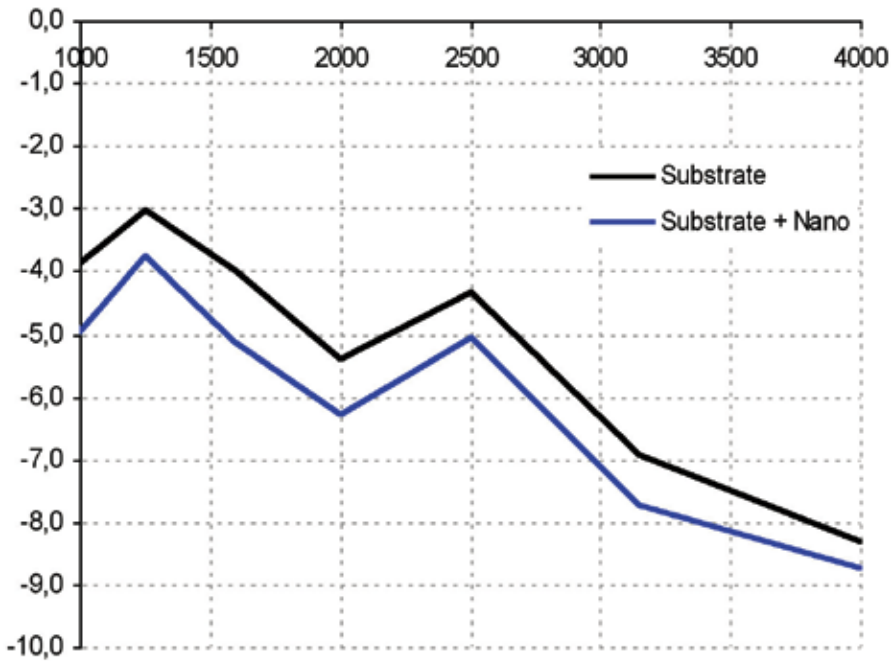


Diagram 2. Typical measurement results for a thermobonded nonwoven absorbent (Substrate) and the corresponding substrate covered with a layer of nanofibers (Substrate + Nano).

Results from the corresponding measurements on woven fabrics with or without nanofibers showed the same tendencies. As can be seen from the discussion above, the use of nanofibers in sound absorbents is very promising. Still, further research on the fundamental mechanisms responsible for the enhanced sound absorption of nanofibers is needed.

Nanofibers in tissue engineering

Tissue engineering is the re-growing of body tissues and organs and a field with intense research mainly driven by shortage of organ donors. For successful creation of new organs, suitable cells and nutrients for the cells are crucial and represent entire research areas in themselves. The activities of Swerea IVF in tissue engineering focus on developing new scaffolds which are needed to provide the cells with a surface that can support and promote cell growth. In the human body this function is provided by the extracellular matrix.

The main advantage of electrospun nanofibrous scaffolds in tissue engineering applications is their body-mimicking structure, i.e. the resemblance between the electrospun nanofibers and the extracellular matrix.^{2,3} Furthermore, the large surface area of the nanofibers enables efficient functionalization, e.g. surface modifications or incorporation of particles such as growth factors, drugs or other biomolecules.² Also, electrospinning is a flexible method allowing close control of the morphology of fibers and scaffolds using parameters such as electric field strength, polymer feed rate, polymer concentration, etc.^{2,3} This is especially useful in tissue engineering as different cells have different requirements on their environment for optimal growth.

Many studies indicate that cell adhesion and proliferation is enhanced on nanofibers compared to microfibers. However, there are disadvantages of electrospun scaffolds as they generally have small pore size and limited porosity.² The porosity of an electrospun scaffold is normally 70-80%. This is most often not enough for adequate cellular infiltration into the three-dimensional scaffold as the pore size required for cellular infiltration is usually at least in the order of a cell, i.e. about 10µm. Often even larger pores, up to several hundred micrometers, are required.^{2,3,4} Using porogens (e.g. salt or wax particles) or blowing agents are two ways of increasing the scaffold porosity. However, these methods can cause problems with interconnectivity of the pores

and collapse of the structures upon extraction of the particles. In recent years it has been seen that mixing nano- and microfibers is a viable option for increasing the scaffold porosity.^{2,5,6} The microfibers then provide a porous structure while at the same time the benefits of the nanofibers can be efficiently utilized.

A new way of creating highly porous scaffolds with a combination of nano- and microfibers has been developed at Swerea IVF and is based on electrospinning nanofibers onto single microfibers (Figure 3).⁶ The nanofibers are then present to enhance cell adhesion and spreading, although by collecting them on a microfiber they can easily be formed into any shape, size, and most importantly, into scaffolds of any porosity.

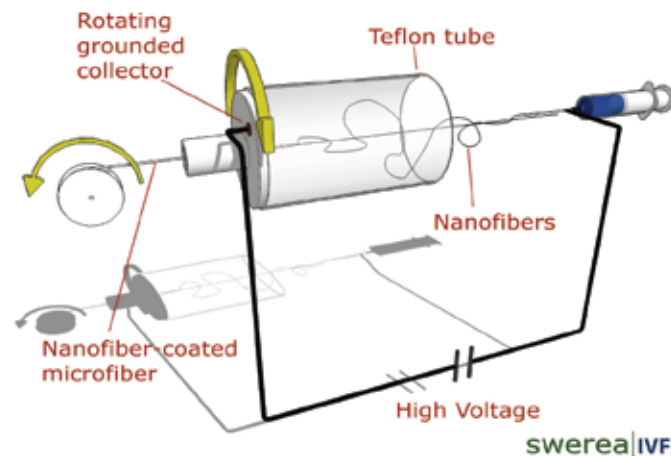


Figure 3. Electrospinning of nanofiber-coated microfibers

The nanofiber-coating can be obtained by using a grounded collector rotating around the microfiber, as illustrated in Figure 3. As the collector rotates the electric field follows, hence forcing the nanofibers to collide with, and be collected upon, the microfiber. The result is a microfiber coated with nanofibers, as seen in Figure 4. The nanofiber-coated microfiber can then be formed into scaffolds of any size, shape and porosity.

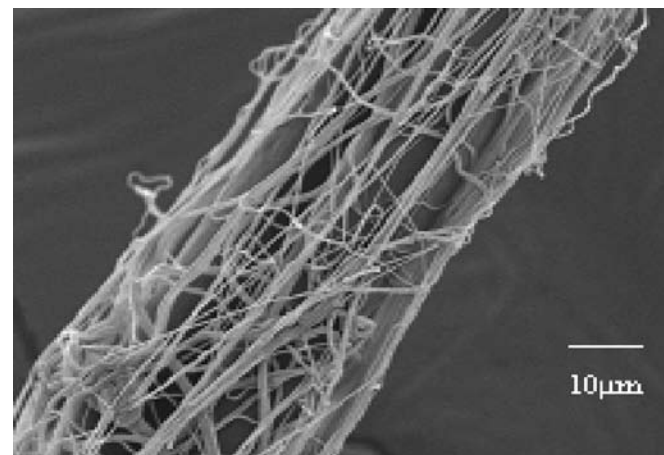


Figure 4. Nanofiber-coated microfiber

In collaboration with Chalmers University of Technology and the Sahlgrenska University Hospital, scaffolds of 95-97% porosity were electrospun and a preliminary cell study with chondrocytes was carried out to investigate the infiltration of cells into the scaffolds.⁶ The results showed greatly enhanced cellular infiltration in scaffolds of nanofiber-coated microfibers compared to scaffolds of only nanofibers. Furthermore, the study showed that the porosity of the scaffolds containing nanofiber-coated microfibers could be carefully tailored, important for creation of optimized scaffolds to be used in tissue engineering applications.

The research in the area of tissue engineering is intense and a lot of progress has been made in the last couple of years. However, there are still many obstacles to overcome before tissue engineered products can be regularly found on the market and being routinely used in patient care.

Nanofibers in wound care

The body-mimicking structure of electrospun matrices can be utilized not only in tissue engineering, but also in wound care applications to improve the healing of a wound as it promotes the re-growth of tissue.² Incorporation of drugs or bioactive molecules is also important in this context.⁷ Depending on the morphology of the fibers and the choice of material the degradation behaviour of the fibers, and thereby the drug release, can be modified.⁷ A sustained controlled release is usually beneficial in wound care as it limits or prevents the initial burst effect seen in traditional injection of drugs. Also, incorporating the drug into a fiber matrix allows a very specific and local delivery of the drug, decreasing the amount of drug required for desired effect.

Using biodegradable nanofiber matrices adds an additional benefit to electrospun wound care products since removal (sometimes painful) of the product is unnecessary. By choosing an appropriate material the nanofibers allow the healing to occur, while at the same time degrading and leaving behind only waste compounds that the body can take care of by natural means.^{2,7}

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The all-important *difference...* concepts of creativity in the fashion design process

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These notes are based on presentations given at the Sensuous Knowledge-conferences organized by Bergen National Academy of the Arts.

I The all-important *difference...* Concepts of creativity in the fashion design process, Sensuous Knowledge 2007

1

We all know how important methods and systematic work is in the creative processes of design and artistic work. In the beginning there is an idea, a concept, a simple fragment of something. Turning this into a film, a piece of music, an installation, a building etc. involves systematic composition one way or another. This relates to a basic axiom of creative work; expressions derive their inherent strength from the strength of systematic work.

It is an axiom you might like or dislike, trust or distrust, but it is there – and has always been – as an underlying theme in the practice of design and artistic work. It is also a demarcation line between practice itself and the history and theory about the resulting design and art works.

The project we report on here has been funded by The Knowledge Foundation (KK-stiftelsen) "Design rationale in fashion design - unfolding the design process in fashion design through practice grounded design research" and the Council for the Renewal of Higher Education (RHU) "Interaction design methods in fashion design teaching"

2

Compositional methods and techniques help us in directing the magical turn from analysis to design, from impression to expression. These methods and techniques rest on a foundation that models – implicitly or explicitly – the creative process; what does it mean to compose a piece of music, what does it mean to make a film etc.? Such a foundation also serves as a basic framework for the discourse.

That is where we find the basic concepts we use to frame the creative process. The development of general methods and techniques is consequently a basic issue in design research as well as in artistic research; it serves the double purpose of strengthening the foundations for practical work both with respects to tools and with respect to discourse.

3

There has been extensive development of design methodology and theories about the design process in the context of industrial design. Attempts has also been made to transfer this type of methodology to the area of fashion design, but very little is done to build a specific methodological foundation for the fashion design process except for explicitly business oriented models.

Central to models and methodology in industrial design is the idea that we handle a problem in the design process; we solve a problem given in the brief. Creativity is basically about solving a problem and expressing a solution. This does simply not make sense in fashion design. What is the basic creative turn in fashion design all about?





4

In continuation to a pedagogical development project on fashion design teaching, we started in 2006 a project at The Swedish School of Textiles to explore and investigate this question – a project funded by The Knowledge Foundation and The Swedish National Agency for Higher Education (Berglin L., Cederwall S. L., Hallnäs L., Jönsson B., Kvall A-K., Lundstedt L., Nordström M., Peterson B., Thornquist C., Interaction Design Methods in Fashion Design Teaching, *The Nordic Textile Journal* 2006-07 . Also published at www.nshu.se.

Methodologically the project is a combination of theoretical reflection and practical design work; concept formation on basis of exploration of different kinds of fashion design processes, from very commercial design to very experimental and critical design.

This work led to the suggestion of replacing “solving a problem” by “introducing a difference” as a basic notion for defining the creative turn in fashion design.

To make this more precise we formulated a theoretical model – *the fashion design diagrams* – as a foundation for explaining what the notion of “difference” means here.

5

In product design, or industrial design in general, we so to speak solve a problem by introducing a construction of some sort – a thing, a system.

One way to look at the fashion design process is to say that we introduce a difference to express people. What is this difference all about?

In fashion design there is never any question about what it is we design, there are no obvious problems to solve; we express people by dressing them. The basic thing is the difference the garment introduce; it is a skirt, a pair of trousers, but still a bit different in some sense, from the mere copy to the truly original.

6

To dress people is something that resides within a duality between wearing intentions and wearing expressions:

- Wearing intentions (WI); generally what we do wearing the garment,
- Wearing expression (WE); generally what the garment does as we wear it.

7

The fashion design diagram builds on explaining fashion design as introducing a relation between wearing intentions and wearing expressions.

Both wearing intentions and wearing expressions refer to some given garment X. We may then view fashion design as a process of defining “that” garment which wearing intentions and wearing expressions refers to an thereby relate wearing intentions and wearing expressions to each other. We, so to speak, express a relation between wearing intentions and wearing expressions in the process of designing.

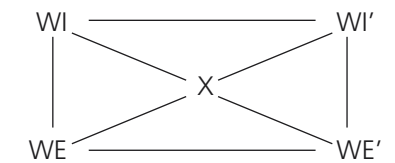




8

WI and WE can be an abstraction or something concretely given and it is the garment X that relates the abstract and the concrete instance to each other. Given abstractions WI and WE we define in the process of designing the garment X that WI and WE refer to and given a garment X we can by use derive concrete WI' and WE' by wearing X.

Viewing basic possibilities in this we can draw a diagram over different ways in which the garment X relates WI and WE to each other.

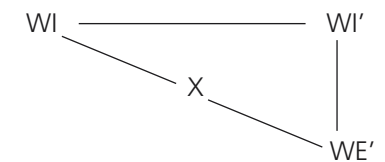


In the diagram we find eight different triangles that we can use as a conceptual framework for different basic aspects of the fashion design process.

9

To each diagram triangle we associate an equation.

$$WI' = WI(X) \& WE' = X(WE)$$



We read the expression WE(WI) as "what the **garment** does with us" and similarly WI(WE) as "what we do with the garment" which means we think of wearing expressions as defining the garment in some sense and wearing intentions as defining "us" in some sense.

**10**

We dress people to make a difference. This difference is a duality we introduce in the process of designing. The fashion diagram is a suggestion how to model this.

We design a garment X for given WI , WI' and WE' that solves the equation $WI' = WI(X) \& WI' = X(WE')$. The dualities (WI', WI) , (WI', WE') are the differences we introduce. We all know what walking is, but walking wearing this garment introduces that all-important difference.

11

So what we say is that to be creative in fashion design is to introduce a difference by relating wearing intentions to wearing expressions.

12

Dressing people can be seen as the process of relating wearing intentions and wearing expressions through a garment.

13

This is what such models do; they provide us with tools to talk about the directions of creativity.

14

This is what such models do; they introduce a foundation for training creativity in a systematic way.

II Experimental design discourse – the dual nature of design methods, Sensuous Knowledge 2006

1 The missing result.

What is all this as research?

Where is the discourse that communicates this as research? It seems to me that the notion of a “result” is a key issue here, the knowledge that is supposed to come out of true research. You present your experiment and people ask; so what is the result?

2 Experimental design as research.

We perform design experiments to critically explore design, but what and where is the result? Where is the knowledge that is supposed to come out of the experiment?

Something is wrong with these questions. It is as if they ask for a conclusion that is still missing. It is difficult to accept the experiment itself as the “result” – it is somehow not talking directly to us in terms of propositional knowledge.

Where is the result, what did we learn, what do we know now?

3 Experimental fashion design.

The haute couture tradition, for example, represent research; a more or less systematic exploration of fashion form.

What is the experimental garment? What is the result of the haute couture experiment? It is a search for new expressions, new forms. The catwalk is where this “result” is presented.

Here it is, this is it...just look. It broadens and deepens our view of garment; this is what the experimental garment does as a “result”. And there is a design discourse; the silhouette, the spectacular line, a specific form of contrast, balance...

4 Common practice.

This is of course common practice in all forms of art. But there is still a basic difference between critical analysis of a given piece of art, a given design example and explanations of the results of a design experiment, of an artistic experiment. This is also where we continuously have to further develop the systematics and conceptual precision of an experimental design discourse, an experimental art discourse.

In some sense this is what foundational theory is all about in practice based design research and experimental art practice.

It is always somewhat easier to do this with respect to matters of craft and techniques and a lot harder when it comes to issues of aesthetics.

5 Analytical knowledge – design knowledge.

Given X, the analysis of X is a construction K proving a proposition P about X – we then know P. This means we have propositional knowledge about X. That we know P about X is a derived conclusion – what we normally call a result.

Design of X is a construction K defining some P which is a X – we then see P. This means we have definitional knowledge about X. That we see X through P is a given axiom.

6 What is the conclusion?

In defining P we explore X through design. What is the conclusion you might ask? This is an irritating question in the sense that it doesn’t seem to make sense. It is as if we think of something else, trying to answer the question as if what we are doing is something else.

To answer the question you could take P and just use it to demonstrate what it is – take the car and drive away, use the mathematical definition to introduce rigour in practice etc. But this is an answer that begs the question. That it is a car is given.

7 Not forwards – but backwards.

The research content lies rather in the way in which the construction explores X – not that it is a car, but what it says about construction of a car.

Not forwards to draw a conclusion, but backwards to tell about the construction.

We explore a notion, a concept through a construction. The definitional knowledge resides in the logic inherent in the definition that presents the construction.

The traces this type of research leaves behind are not propositions, but design methods and design programs.

8 A research discourse.

Methods are the rules and frameworks we use to systematize our work, but methods can also be a discourse through which we explain and discuss the “result”.

As such design methods explains what the design experiment is, i.e. what the definitional knowledge is all about.

Design methods are in this sense both a guiding force and the foundation for a discourse through which we see the design example itself as the result of the experiment. Design methods traces the way in which we build things, the way in which we explore a given concept.

Basic methodological notions provide the foundation for a research discourse.

9 Conclusions – introductions.

A proposition P sums up and presents a conclusion while a definition P opens up and presents an introduction. Design methods as foundations for design research is just that; a discourse for research as exploration through the introduction of things and concepts.

What is the result? I don’t know, I was defining things not drawing conclusions about things already there.

All photos were taken by the author at the international fashion student competition *Concours international des Jeunes Créateurs de Mode* in Paris 2005. That year 160 students from 16 countries participated in the competition and we were very happy to see one student from our school – Maria Nordström – winning the prize for the best Swedish contribution. The photos tell stories about creativity, and basic decisions, in the fashion design process. But they also tell catwalk stories.















Centrifugal spinning of nano-fiber webs - A parameter study of a novel spinning process

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Introduction

A well known method of producing nanofibers is the electrospinning process. In this process^{1,2} a polymer solution is subjected to electrostatic charging whereby the electrostatic repulsion overcomes the surface tension and results in the ejection of thin liquid jets. The jets are further stretched in an electric field under simultaneous evaporation of the solvent resulting in the deposition of a "nano-fibrous" non-woven fiber mat. Fibers can be produced from single or multiple capillary needles or by needlefree electrospinning from a free liquid surface³. By these processes fiber diameters well below 1 μm can be achieved. However, the production rate from the electrospinning process is low and scaled-up variants appear to be technically complex and expensive.

Recently, a novel device and process for large scale production of nanofibers was invented at Swerea IVF⁴. The process combines concepts of centrifugal spinning with electrospinning. The purpose of the present communication is to give a description of the new process and to present a phenomenological process parameter study. The main objective of the parameter study was to optimize the process parameters in order to obtain fibers thinner than 0.5 μm and with a minimum of defects in the nano-fibrous coating in the form of beads and holes. It is not within the scope to discuss in detail the physical background to the presented phenomena.

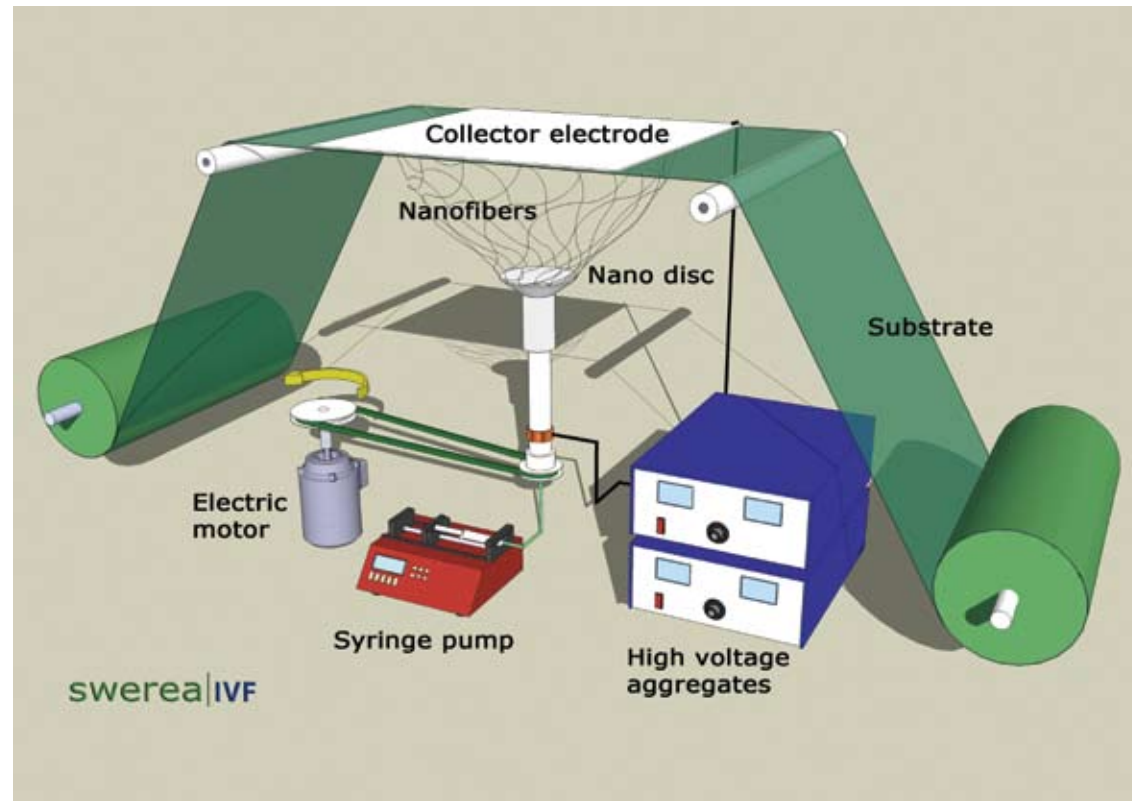


Figure 1. Device for nanofiber production.

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Novel fiber spinning device

The recently invented fiber spinning device is shown in Figure 1.

A detailed picture of the rotating disc is reproduced in Figure 2.



Figure 2. Rotating spinning disc manufactured from gold plated aluminum. Disc diameter is 100 mm.

A polymer solution is pumped and deposited centrally onto a quickly rotating spinning disc. Due to the centrifugal forces the polymer solution is transported radial towards the rim (perimeter) of the rotating disc where the surface tension is broken by the centrifugal force and a multitude of liquid jets are ejected. An electric field is applied between the disc and the collector electrode by a high voltage supply. The electric field is directing the liquid jets towards the collector and helps to stretch the jets to very fine dimensions under simultaneous evaporation of the solvent leaving a dry nano-fibrous coating on

the substrate passing the collector plate. The total cost of the different components is less than 10.000 Euro and the construction can be made very simple and robust.

Process parameters and materials

The main objective of the parameter study was to optimize the process parameters in order to obtain fibers thinner than 0.5 μm and with a minimum of defects in the nano-fibrous coating in the form of beads and holes. The process parameters studied where 1) polymer concentration in solvent, 2) distance between disc and collector, 3) flow rate of polymer solution, 4) revolution speed of disc (rpm) and 5) electrical potential between disc and collector (voltage). The polymer was PA6 with $M_n = 44000$ g/mol (Ultramid 3300 from BASF). The solvent was formic acid. The substrate was a spun bond PET non-woven.

It should be noted that the process is insensitive to ambient conditions like temperature and humidity. This is a clear advantage compared to needlebased or needleless processes which sometimes produce very different results depending on relative humidity.

Defects

Two types of defects in the nano-fibrous coating deposited by the depicted spinning device have been identified to occur. These are beads and holes, as shown in Figure 3.

The beads vary in size from a few up to some 20-30 μm . They are formed by small polymer droplets. The formation mechanism is not known at the time being. Beads are considered less detrimental to many applications while the holes are certainly detrimental to applications like filter media, membranes and barriers. They are formed by larger drops that are still “wet” when reaching the substrate and there “melts” the already formed nanofibers.

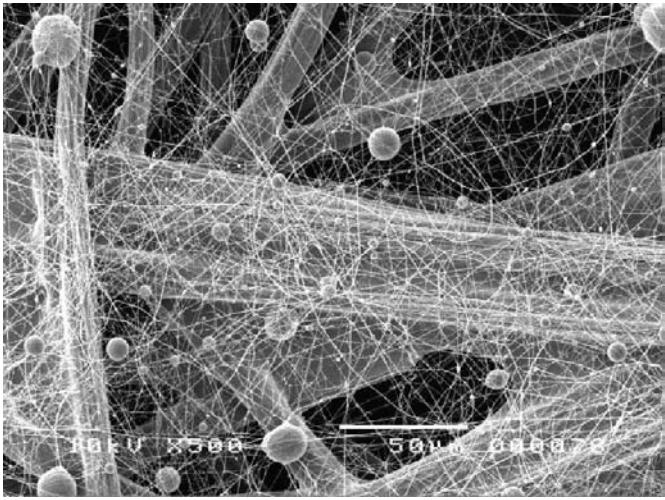
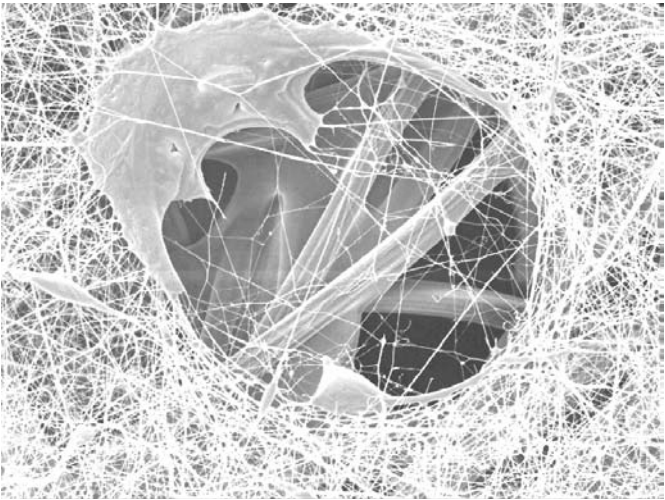


Figure 3. Defects in nanofiber coatings: beads (left) and holes (right). The background seen is the spun bond PET substrate.



Experimental design and evaluation

Factorial designed experiements

The worksheets for screening and full factorial investigation were achieved by the software MODDE⁵. To evaluate trends in the effect on fiber diameter and morphology for each of the five chosen process parameters, a screening was performed. Each parameter was given two levels, high and low, and center points were added as shown in Table 1.

The fractional factorial design used in screening was acquired by a 2^{V-1} design resulting in 19 experimental runs. Samples were taken for each run and examined by scanning electron microscopy (SEM) and light microscope and an image analysis was performed to evaluate the response on average fiber diameter. Hole and bead occurrences were subjectively assessed for the different parameter settings. The discrete scale was in three steps: 1 = almost no beads or holes, 2 = some beads and holes, 3 = many beads and holes. After multiple regressions, hole and bead occurrences can adopt values in between these steps. These values are hard to interpret into real hole and bead occurrences. But a tendency is shown which can be used for minimization of holes and beads.

After the screening, three parameters were chosen as most important while rotation (6300 rpm) and voltage (100 kV) were held constant (Table 2). These were then investigated in a three level full factorial study, giving 27 runs, with an addition of 3 minimum points. Samples were taken for each run and examined by SEM and light microscope and an image analysis like the one performed during the screening was carried out.

5 MKS Umetrics AB, Sweden

Parameter	Low	High	Center
Concentration/ wt% PA6	10	16	13
Distance/ cm	36	56	46
Flow/ ml/min	4	8	6
Rotation/ rpm	2500	7500	5000
Voltage/ kV	50	100	75

Table 1. Parameter values for screening experiment

Parameter	Low	Center	High
Concentration/ wt% PA6	7	10	13
Distance/cm	36	46	56
Flow/ml/min	4	6	8

Table 2. Parameter values for full factorial study

Results and discussion

Diameter distribution

The distribution of fiber diameters is rather broad. In Figure 3, a histogram with over 200 diameters measured from four different runs with the same parameter settings appears to have a normal distribution. The normal distribution (curve in the diagram) is N(263,77²) with the amplitude fitted to the histogram. A broad distribution of fiber diameters has also been found from needleless electrospinning from a free liquid surface⁶. Electrospinning from single capillary needles appear to produce more uniform fibers. The importance of this may vary with the application. The average diameter measured from SEM images was 263 nm in Figure 3. It should be noted that the actual diameter is somewhat lower since the fibers are sputtered with gold in order to avoid electrostatic charging by the electron beam in the SEM. The thickness of the gold layer can be estimated to be in the range 10-50 nm (20-100 nm on the diameter).

6. D. H. Reneker et al., *Nanotechnology*, 17(2006)1123.

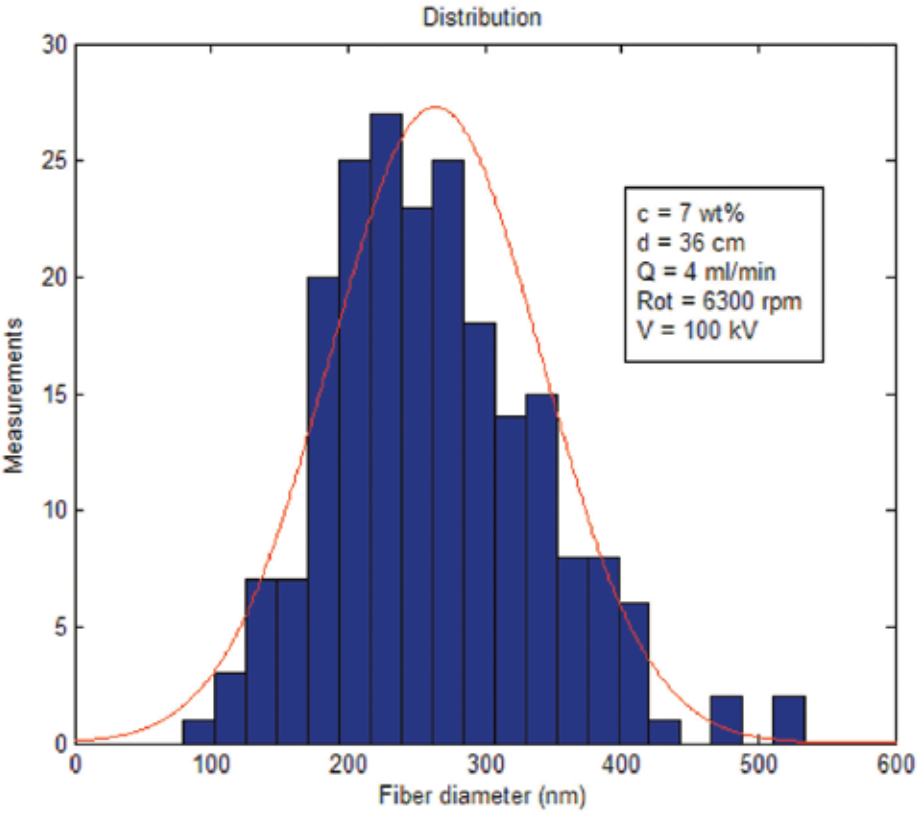


Figure 3. Diameter distribution for over 200 fibers showing a normal distribution

Screening experiments

The parameter values for the screening experiment are shown in Table 1. The effect on fiber diameter, holes and beads for the different parameters is shown in Table 3. The overall confidence intervals for the main effects obtained from multiple linear regressions were wide for the fractional factorial study but the tendencies shown could be used to decide on which parameters to be used for a full factorial study.

Increasing parameter	Diameter	Holes	Beads
Polymer concentration	↑	↑	↓
Distance	↑	↓	↑
Flow rate	→	→	↑
Rotation speed	→	↓	↑
Voltage	↓	↑	↓

Table 3. Main effects of parameters in screening test.

It is seen that polymer concentration and electrical field strength (voltage divided by distance) are important for the resulting fiber diameter. Low concentration and high field strength promote thin fibers. This is intuitively what one would expect since a low concentration will reduce the viscosity and thus the resistance towards stretching of the liquid jet. An example of the effect of concentration on fiber diameter is shown in Figure 4.

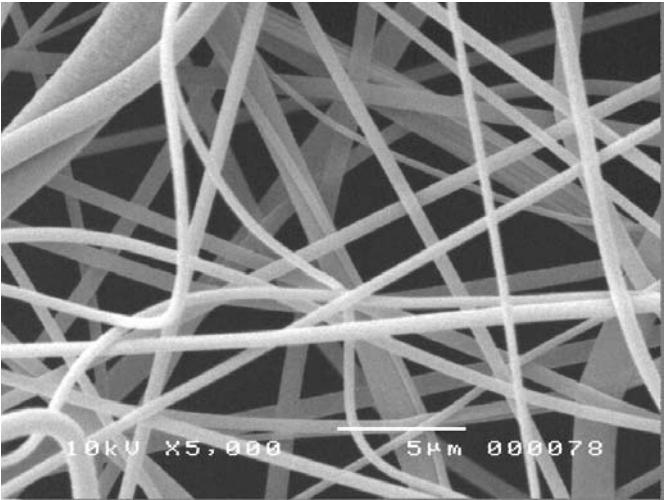
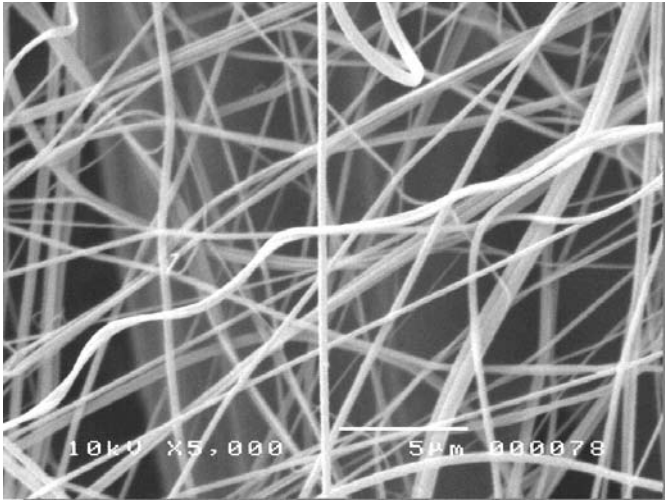


Figure 4. SEM-images (magnification was 5000x at 10 kV) from samples with 10 wt%, 2500 rpm (left) and 16 wt%, 7500 rpm (right). Distance, flow rate and voltage were held constant (d=36 cm, Q=4 ml/min, V=100 kV). The length of the scale bar is 5 µm.

Figure 4. SEM-images (magnification 5000x at 10 kV) from samples with 10 wt%, 2500 rpm (left) and 16 wt%, 7500 rpm (right). Distance, flow rate and voltage were held constant (d=36 cm, Q=4 ml/min, V=100 kV). The length of the scale bar is 5 µm.

High field strength will lead to a high charging of the jet and higher electrostatic force acting on the charges in the jet, both factors promoting stretching of the jet.

Flow rate and rotation speed has only little influence on fiber diameter. It seems fiber diameter is affected rather by parameters involving stretching of initiated fibers than by parameters affecting the flow of solution on the disc surface, as rotation speed and flow rate. Increasing the flow rate results in an increase in bead formation while no effect on hole occurrence is observed, which indicates that higher production rates can be achieved without affecting the number of holes. Since rotation speed had only little influence on fiber diameter it was held constant in the full factorial study.

Despite the fact that flow rate did not seem to affect fiber diameter it was kept as a parameter in the full factorial study since it will be crucial for production rates.

High viscosity seems to prevent bead formation. Beads are formed when surface tension is high comparing to viscosity and so the high viscosity at higher concentrations leads to less bead formation. This is unfortunate since thinner fibers are looked for in most applications, cf. filtration. At the same time more macroscopic holes are observed. These are probably formed from larger drops which have too small surface-to-volume ratio to solidify. Solvent is not vaporized and dissolve the fiber web when attracted to the substrate by the electric field. The concentration dependency on fiber diameter is of great interest in yielding thinner fibers and was therefore used as a variable in the full factorial study.

Full Factorial Study

The parameters chosen for the full factorial investigation were concentration, distance and flow rate, see Table 2. Since more information is gathered from full factorial investigations, smaller standard deviations are present giving narrower confidence intervals. The results are therefore more accurate and reliable than results from screening. The results are summarized in Table 4. The full factorial study confirms the results from the screening, comparing Tables 3 and 4. Because of the strong dependence of fiber diameter on concentration, the concentration interval was switched to lower values; 7, 10 and 13 wt% of PA6 in formic acid, to gain even thinner fibers. Holes and beads were observed with the same dependencies as in the screening. For minimizing of fiber diameters, the concentration should be held as low as possible and with this decrease in concentration a decrease in holes is expected, which is a rather convenient coincidence. However, the beads are expected to increase in numbers and are the limiting factor for optimization by concentration manipulation.

Regarding distance, the fiber diameter and occurrence of holes is influenced in the same way as shown in the screening, but there is a difference in bead occurrence, compare Tables 3 and 4. The results from the full factorial study should be regarded as more accurate, but the measuring method is poor due to subjective estimations used for quantification. Shorter distances would then be preferable in minimization of fiber diameters (high field strength). A shorter distance, however, will also yield more holes, according to the used process interval, while the occurrence of beads is expected to be unaffected.

Increasing Parameter	Diameter	Holes	Beads
Concentration	↑	↑	↓
Distance	↑	↓	→
Flow rate	↓	→	↑

Table 4. Main effects of parameters in the full factorial test.

According to the screening, flow rate would have no effect on fiber diameter. The full factorial study, however, showed a small tendency of decreasing diameters with higher flow rates. Higher flow rates do not affect holes significantly, but more beads are to be expected. Outside the used interval other behaviors might occur, but scaling-up by increasing flow rate is probably possible without thickening of fibers or increasing of hole occurrence. To minimize fiber diameters and holes, the flow rate is to be as high as possible. This will, however, lead to substantial bead formation.

Production rate and fiber distribution

With the parameters used in the present study and a nanofiber surface weight of 1 g/m², the production rate reached was 30 m²/hour. It is expected that further improvements of the process will facilitate production rates up to 100 m²/hour from a single disc. By using multiple discs simultaneously, high production rates can be achieved. Due to the asymmetry of the disc compared to the substrate, the surface density of nanofibers is higher towards the edges of the substrate. For a 40 cm wide web, using a stationary spinning disc, the variation around the average surface weight was some ±20%. The uniformity can be improved by using multiple, reciprocating discs. The shape of the collector electrode may also be optimized for better uniformity.

Acknowledgement

The parameter study presented was performed by Jens Persson and Johan Friberg at Swerea IVF in Mölndal as a part of a diploma work for the degree of Master of Science at Lund University, Faculty of Engineering (LTH).



Photos by Clemens Thornquist

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Modelling – Fashion theory and theory of creation

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A model [theory] generally illustrates a formalized and simplified perspective – in turn derived from e.g. an overlaying paradigm, ideology or tradition – of a more complex thing, process, being or something in becoming. As a physical, logical or mathematical construct of static and dynamic variables it may perform the function of visualizing and abstracting facts and figures, movements and patterns, as well as being a plan, implying results, propositions and actions to be taken. But moreover, a model is also where a theory [vision] can be tested, simulated, reworked and replicated. Like a laboratory it makes up a reality and realm where certain elements may be foregrounded and others ignored for the reason to study a certain perspective [module] or certain perspectives [modules], each for themselves and together.

In other words models share the possibility to hold some aspects open of that which it aims to illustrate because it leaves out certain variables – deliberately or not – as it at the same time includes other variables. As such a model or theory is just like a sculpture of art in that it aims to constitute a »pleasantly untruthful content« as a mean in the production of truth, as Swedish philosopher Hans Larsson would have it. Or to use Heidegger's vocabulary, one could say that a model like Heidegger's work of art holds open the open of the world. »The work as work, in its presencing, is a setting forth, a making«. A model liberates the freedom of the open and establishes this freedom in the becoming truth. In that the model sets forth and erects something it also brings about the openness of that something when what has been set forth is a work [of art].

And it is precisely here we find the fascination – fetishizing – of the model, or as in our example: the dummy and equally »pre-model« for garment and fashion models [toiles]: the tailor's mannequin. In generic terms the tailor's mannequin means the presences of certain qualities as well as the absence of others. However, a pre-model like the tailor's mannequin or any other form of artistic and scientific model also means the presence and absence of its associated greater whole in the same moment as in indicates but does not replace. The pre-model of garment making is at once both the presence and absence of the human body. On one hand, as a pre-model, the tailor's mannequin is made to suggest a quality of blandness and impartiality, and therefore more open to possibilities than the toile it will host. To draw on Henri Bergson; the pre-model becomes a matter from which spirit borrows the perceptions on which it feeds and restores them to matter in the form of movements – the toile as an vision – which a creative spirit has stamped with its own freedom. However, on the contrary to Bergson's amoeba as he suggested to be open to endless possibilities, even the pre-model – considered in becoming or as something become – the freedom with which it might be stamped »always seems to have its roots deep in necessity and to be intimately organised with it« as the pre-model also has its history and future, which have given it its distinct form. This is to say; there is in a model both a resistance to transformation post by its matter as well openness to revolution because of its disability for closure. Hence, a model [conception] is a perhaps not neglected, but most often underestimated form or phase of creation that can either set its will against or work in favour, regardless if its initial classification was scientific or artistic – they are all creation.

This article is as much about the contextualisation – necessity and pre-organisation – of models [theories] in general, as it is about the space between absence and presence formed by the model; the model's gestalt quality if you like, here formed by the space between the absence and presence of human beings in the tailor's model.







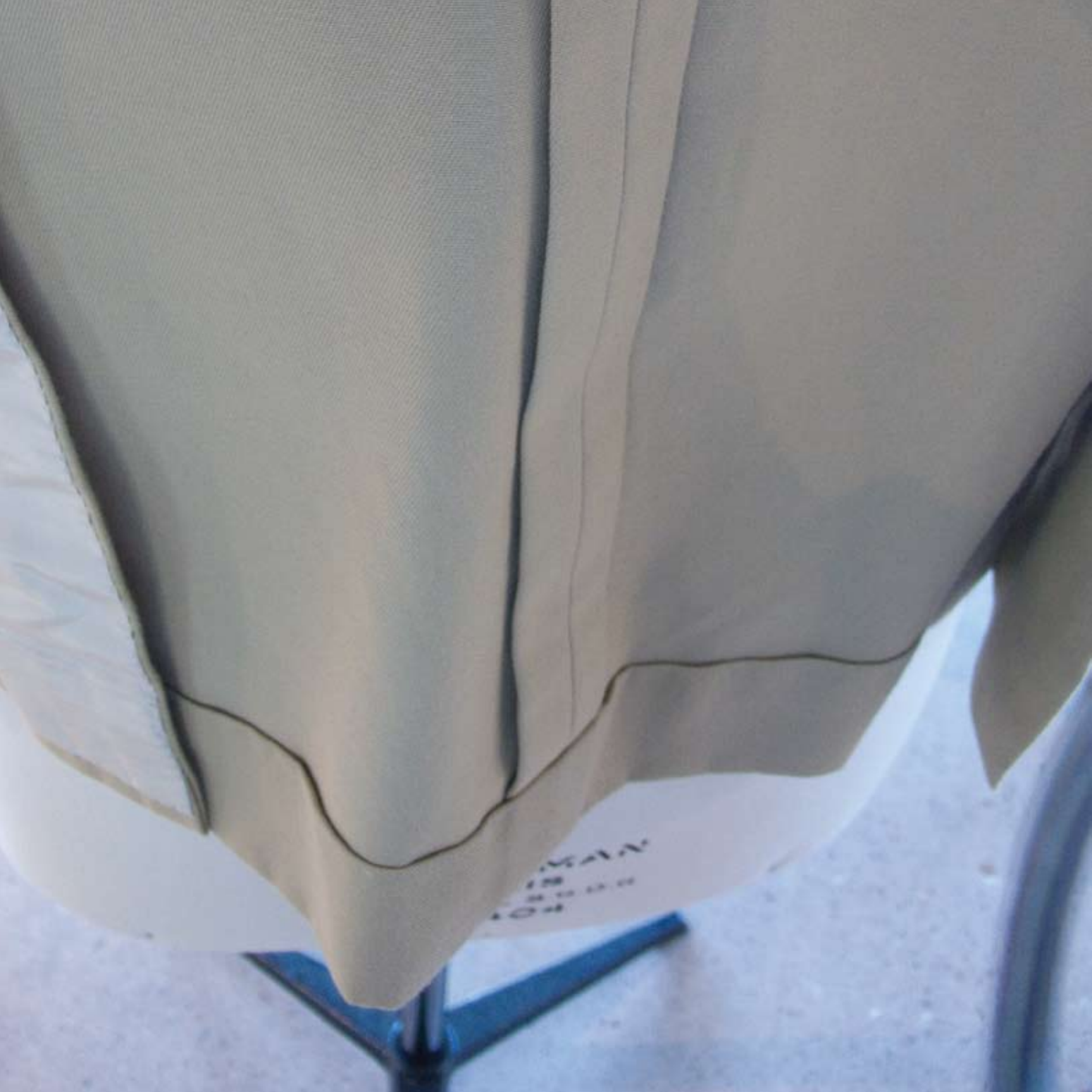


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Drape; The Radical Elegance

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The man's suit, as it is generally thought of today, carries with it an unsolved conflict. On one hand, it has become an iconographical structure; it is one of the reference points for men's fashion in general – on the other hand, the shift from normative dress to personal dress in society in general has made the suit an exception in menswear, a choice of dress that places the wearer in an alternative position vis-à-vis most men.

This shift is especially interesting to contemplate in relation to the English bespoke suit. In its normative appearance, this model of a suit represents the idea of dressing as to provoke as little emotion as possible – dressing to fit in with one's peers. In its promotion, ideals of dignity, reliability, professionalism come to mind. Broadly speaking, a deconstruction also of these values has taken place. It is harder to define professionalism today than 50 years ago – and wearing a suit is certainly not all one has to do in order to become a professional, if this was ever the case.

However, when acceptance among one's peers is more about the capacity for successful navigation among cultural symbols, than ability to convey acceptance of an iconography, mastery of fashion becomes an attractive trait. The shift towards this has placed the bespoke suit in unfamiliar territory, it is no longer part of a static uniform. Rather it is fashion like all other fashion. Or is it? Can the bespoke suit be thought of as a radical critique of fashion? An alternative route for those fed up with normative nihilism?



Below follows a description of one of the projects in my forthcoming Ph.D. dissertation, a bespoke suit devised to embody a critique of the contemporary suit's structure and appearance. I argue that the conventional suit, both in ready-made and bespoke versions, is ill-suited for introducing poetic beauty in the often speculative realm of fashion, in which eternal teenager-ism, and tiresome fake-rebellion prevail.

One of the traits of conventional tailoring is the modelling of the garments onto the wearer's body, using darts, interlinings, padding and other methods of manipulating the shape of the garment. Ultimately, this is an exercise in dressing the wearer's body in a flattering way – adhering to a given, and general, set of aesthetic principles. Sloping shoulders are to be straightened out with padding, a flat chest is to be padded.

The bespoke suit presented here is an investigation in another attitude towards the construction of the suit. By reducing the number of materials in the construction, the emphasis is placed on draping the fabric, rather than moulding its shape. This, in itself, is nothing new. The firm responsible for this suits production is Anderson & Sheppard on Old Burlington Street in London, who are well known for favouring a drape cut over a more constructed look. However, with this suit, the assignment was to 1) "drape to the max", 2) to do so in a fabric that is open in its structure, and 3) to carry this out in a three-piece model that can become a system of garments, rather than be perceived as only one garment.



The last part of this brief to Anderson & Sheppard is interesting in its own right. As the coat is the only one garment of a three-piece suit that normally takes interlinings and padding, questions on to relate and un-lined, un-padded garment to the other parts were raised. Would the coat simply look like a shirt in relation to the trousers? Would the waistcoat appear like a coat?

These questions resulted in an exercise in cutting and draping – i.e. precisely the points where bespoke tailoring differs from mass-production, where cutting is done by "blocks" and draping cannot be introduced (as the client is an anonymous figure.)

The process of tailoring, in this case, can be compared to cooking – it is a trying, thinking, exploring process in which the material is absolutely central. Thinking design, just as cooking, brings gestalt to the theory, and also leaves track of the process in the gestalt. The aim, thus, cannot be perfection, but a type of good-ness that exists on the palate. The proof, so to speak, is in the pudding.



This is a normative thought – it indicates that good-ness ought to occur through a process done, in some way, right. But this is also an accessible thought, as it indicates a direction towards balance in design. This balance does not exist in ready-made suits; as the aspect of drape does not exist, the design becomes representative of a fictionalised character built on an advanced game of expectations, conveyed through sophisticated (sort of) marketing. The material becomes a carrier of message that stems from somewhere else than from the material itself. This is where the Freudian itch comes from; the realisation for the wearer that the fabric does not contain anything, as the memories of advertisements fades away, replaced by a reality that cannot become anything but stark. “No garment has ever lived up to its expectations”, Oscar Wilde supposedly claimed.

In my dream state, reality suddenly enters in the form of the dreaming of live. I want to walk these streets with You. Within this thought, all demonstrative prerequisites give way. My suit, formerly my armour, crumbles, and I want it to. I want to tear it apart.

The suit presented here is called “A Walk in the Park”. It is meant to envision a tearing apart and a putting together – a nostalgic reconstruction. This reconstruction is communicated through stitches, which are to be obvious and loved, through the carrying out of craft, not the blind perfection of it. In order for the material to complement this thought, the suit is made out of a simple cotton fabric in khaki colour.

“A Walk in the Park” is not a suit to wrap around oneself, it is rather an open system that does not place any demands on the wearer as to how it is to be used. Its reconstructive ideal lets it become fully usable; any part of it can be worn as a single garment, and it can be combined with other garments. A few wrinkles, even holes and tears, will only add character. Strolls through Positano or Cairo are not unthinkable.

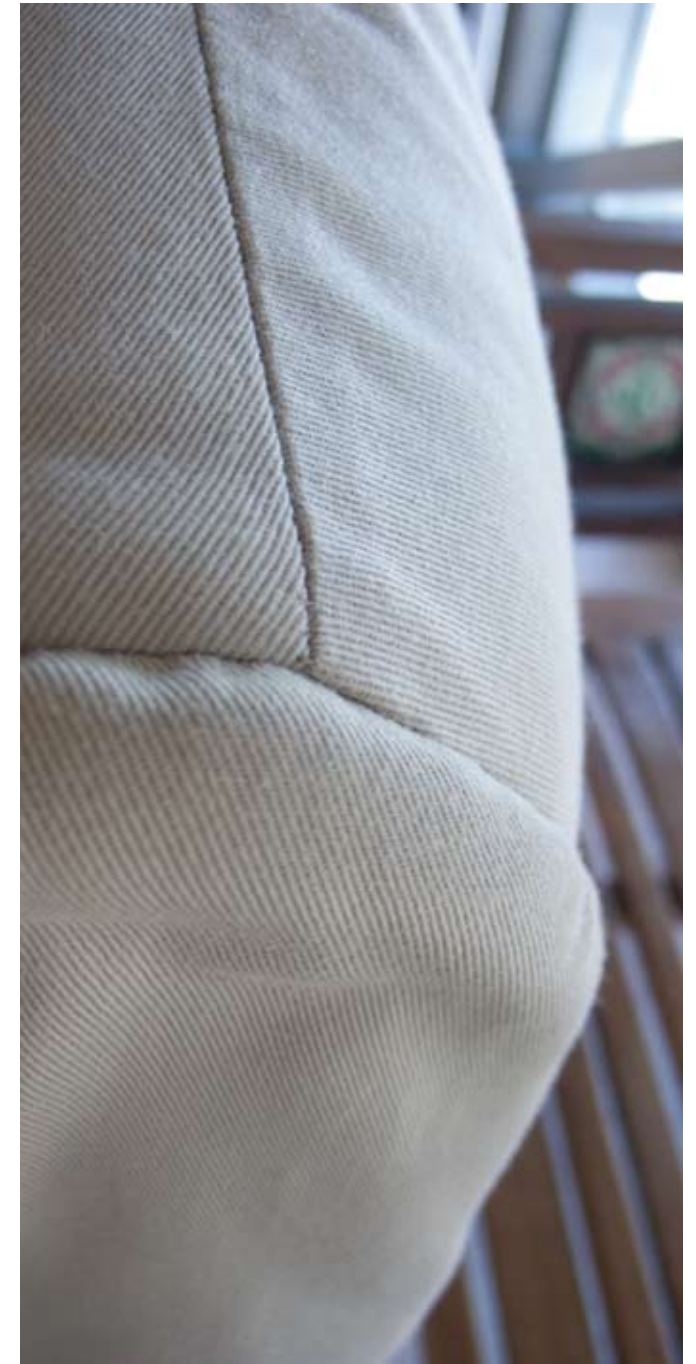




Photo Andrea Björsell

Knit on Demand - mass customisation of knitted fashion products

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Abstract

Today's fashion market is characterised by short life cycles, low predictability and high impulse purchasing. Many fashion companies are responding to this by constantly introducing new collections. Zara, which is considered to be the leader of fast fashion are introducing as many as 211 new models per week. One of the drawbacks of Zara's and others' methods is the resulting over-production; many garments have to be sold to reduced price or are thrown away. An average of one third of the collections is considered waste. It costs money for the fashion companies; it reduces the sell-through factor and wastes natural resources. Knit on Demand is a research project at the Swedish School of Textiles that aims to reduce the waste and increase the sell-through factor and service level. A local producer of knitwear and a retailer of tailored fashion in Stockholm also participate in the project. The purpose of the project is to test new methods of supply chain management and to analyse whether mass customisation is applicable on knitwear. There are several benefits with mass customised garments: the customer receives a garment that is better suited to his or her needs, the producer does not have to make garments on forecast, and the environment and natural resources are spared because only what is bought by the end consumer is produced and shipped.

Key Words: mass customisation, knitting technology, fashion design and fashion logistics

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1. Introduction

The fashion market is characterised by short life cycles, low predictability and high impulse purchasing (Christopher et.al, 2004, Cerruti & Harrison, 2006, Ghemawat & Nueno, 2003). In order to respond to these characteristics companies are constantly introducing new collections and models. There are now so many new models introduced that the seasons have been erased and the leader of fast fashion, Zara introduces 211 new models each week. It is a true challenge, if not impossible to sell all these garments at full price, and often companies are overstocked and left with piles of unsold products at the end of the season. These garments have to be marked down and sold to reduced price or are liquidated. The sell-through factor, which indicates how many of the total SKUs that are sold at full price, is in fashion about 65 percent (Mattila, 2004). One of the reasons is the long lead-time, which in turn is caused by sourcing and production in countries far away. It is not unusual that lead-times from design to delivery in the store are 8-10 months. Fashion companies, by offering the customers a vast amount of choices, have created a new shopping behaviour amongst their customers. Customers now want more fashion even quicker and such demands cannot be responded to with traditional supply-chain management.

Knit On Demand is a research project financed by the Knowledge Foundation in Sweden and carried out at the Swedish School of Textiles. The objectives of the project are to demonstrate production methods for knitwear that may strongly influence the ability of the fashion industry to meet new demands for agility in customer relations. It will also provide insight and transparency in the total cost picture related to logistics and supply chain management. This leads to e.g. improved decision support in outsourcing and offshoring strategies and may contribute to increased local fashion production. Three industrial partners have participated in the project, Ivanhoe, a producer of knitwear, Total Logistik, a third party logistics provider that early on had to leave

the project due to new owner constellations and SOMconcept which was not in the original line up of companies but have joined later. SOMconcept is a retailer of tailored fashion in Stockholm and is one of the pioneers in customised fashion in Sweden.

2. Methodology

The aim of this paper is to present the research project Knit on demand and the development of the project to its present state. The paper takes its starting point in the theories on mass customisation and is built on case studies done during the course of the project. In order to get the sales of customised knitted garment started, the researchers themselves had to take an active role in developing the business concept. The methods used for collecting empirical data were interviews, inspiration journeys and workshops. Learning from these activities were combined with theoretical frameworks for developing and applying a solution.

3. Mass customisation

Fralix (2001) points out that mass customisation is a future direction for the fashion and apparel industry, but garment fit and colour selection have so far limited its use. Tseng and Jiao (2001) defined mass customisation as technologies and systems that can deliver products, which meet an individual customer's needs with nearly the same efficiency as that of mass production. There are business concepts for fashion products, shoes, and other items that combine modern manufacturing technologies with mass customisation. An example of this is the Finnish left® foot company, where the customer's feet are scanned in the shop, and this information is used to manufacture shoes with a perfect fit that are home delivered to the customer within three weeks (Sievänen and Peltonen 2006). Another example is the Internet-based German company Spreadshirt, which sells T-shirts with customers' individually, designed prints. The customer can choose between standard options of T-shirts, and then Spreadshirt produces the customer's self-design on the garment with modern digital printing technology (Reichwald and Piller 2006). This shows some examples of how fashion products can be customised. There are also examples of knitted fashion products, most of them T-shirts, that show that customisation of knitted fashion garments can be done.

Mass customisation is a response to customers' demand for higher variety, more authenticity and a better shopping experience (Gilmore & Pine, 2007, Luximon et.al, 2003). An apparel related example is running shoes: in the beginning of the seventies there were about five different running shoes to choose from, in 1988, that number had increased to 285 (Luximon et.al, 2003) and in 2008 one single on-line retailer offered more than 550 running shoes (Footlocker, 2008). In addition to these 550 running shoes the company offers almost 2000 other models in all sizes. The Spanish clothing company Zara now develops and presents 11 000 different models each year (Lindahl, 2008). At some point the variety may become unmanageable, for the company, and it also confuses the customer. Figure 1 illustrates the correlation between variety and customer satisfaction, at a certain point variety becomes too large for the customer to handle.

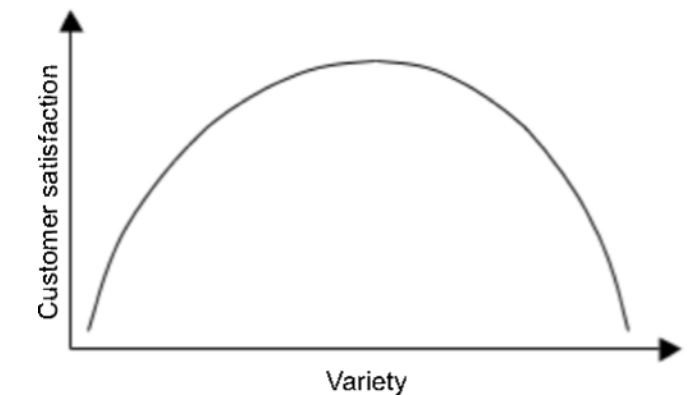


Figure 1. Variety vs. customer satisfaction.

In a survey conducted at the universities of Columbia and Stanford was analyzed how variety affects people's choice. A table with jars of jam was set up and customers were given a one-dollar coupon to buy a jar of jam. Half the time customers were offered six types of jam and half the time they were offered 24 types of jam. When the customers were offered the standard six choices (blueberry, raspberry, strawberry etc.) 30 percent of the customers made a purchase and when they were offered 24 types only three percent purchased the jam. But what was forgotten in the experiment was the presentation of the variety, the jars were randomly placed for the customers to choose from without regard to how customers select products. The result was that variation confuses the customer. However, if the variety is presented in an understandable way, variety is beneficial for an organisation (Anderson, 2006). The Swedish shirt manufacturer Tailor Store AB verifies Anderson's statement by offering their customers 43 000 trillion different combination in an understandable way (Tailor Store AB, 2000)

Mass customised products can by definition only be made to order, they can be designed to order, engineered to order or assembled to order. It is a company's ability to offer customised products that creates its competitive advantage within its segment. According to Amaro et. al. (1999) the decision to produce to order is strategic; most companies that offer mass-customised products only offer customised products. One of the reasons for this may be that traditional supply chain management cannot mix customised products and mass products. Since the market for mass customised goods is marginal, companies offering this type of products have to operate in environments with high customer density or where the customers easily can be reached, such as the Internet or in the centre of a very large city. The most renowned initiative of mass customisation probably is NikeiD that allows the customers to add text to the shoes and alter the colours and to some extent the materials of the shoes. There are many other companies offering a wide range of customised goods spanning from muesli to drums (Configurator-Database, 2008).

There are several degrees of customisation; Gilmore and Pine (1997) have identified four distinct approaches to mass customisation, which are represented in figure 2.

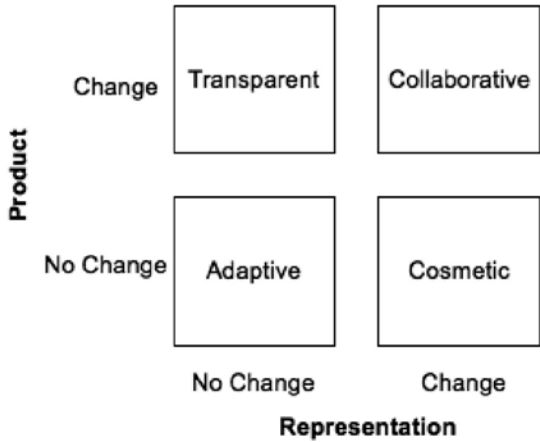


Figure 2. Four faces of Mass Customisation (Gilmore & Pine, 1997).

Collaborative Customisation

High level of interaction with the customer to identify each customer's specific needs and processes that helps to fulfil those needs. Collaborative customisation has many similarities with traditional tailor-made garments.

Adaptive Customisation

One customisable standard is offered and the customers can alter the products themselves. Nike ID lets the customer alter the colours of the shoes and the customer can add his name to the shoe.

Cosmetic Customisation

One standard product is presented differently to different customers. For example food with different packaging.

Transparent Customisation

Individual customisation without explicitly selling the product as "customised". Eyeglasses are an example of transparent customisation.

Mass customisation of garments is often collaborative due to the interaction between the buyer and the seller. In the Knit On Demand project the clothes will be sold in a store so the seller is able to guide the customer through the purchase.

- There are the following drawbacks of customisation, according to Åhlström and Westbrook (1999):
- Increased material costs
 - Increased manufacturing costs
 - Less on-time deliveries

Pine et al. (1993) writes that one of the reasons Toyota failed, when they persuaded mass customisation, was that, they remained in the structures of continuous improvement. Managers did not realize that the problems were caused by failure to transform the organisation from an organisation of continuous improvement to an organisation that could also handle mass customisation.

There have been some criticism on the upcoming trend of mass-customisation; critics mainly ask why it has not been done earlier since most of the tools have been available. The reason for that might be a shift in how people are shopping. Gilmore and Pine (2007) write that customers look for authenticity and experiences when they are shopping. Oneway of adding to the shopping experience is to let the customer design, or configure his or her garment. It also adds to the authenticity of the purchase since, the customer believes that it is a unique design. And it sometimes is, a Swedish on-line retailer of customised shirts offers more than 43 000 trillion different combinations, sizes excluded (Tailor Store AB, 2008).

Whether the design is unique or not is in the eye of the beholder, most customers probably experience that they are designing their own garment but a few would like even more freedom.

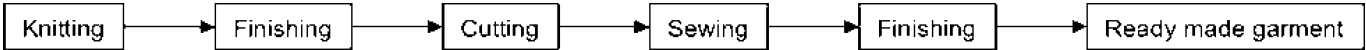


Figure 3.

4. The production of flat knitted products

The flat knitting machine has a linear needle bed that makes it possible to produce flat knitted rectangular panels for products like cardigans, sweaters, skirts, scarves, and other garments. Flat knitting machines traditionally produce knit panels with a fixed edge and a welt at the bottom of the panel, coarse structures, and then such patterns such as rib, jacquard, stripes or cables across the panel. The manufacturing from yarn to ready-made garment can be done in several ways in flat knitting, depending on production methods and the type of machinery used by the company. The production from yarn to ready-made garment consists of several processes, as shown in figure 3. It starts with the knitting process, where yarns from yarn cones are knitted to panels in the flat knitting machine. The panels are often steamed in the finishing process after knitting. In the cutting process the panels are cut to the right shape and size, according to design and quality requirements. The panels are joined together into a garment in the sewing process. To achieve the correct quality, the garment is often passed through a finishing process, such as steaming or washing. The traditional manufacturing of coarse flat knitted garments consists of several time-consuming processes after knitting.

Figure 3. Production process of flat knitted garments.

The manufacturing of flat knitted garments can be divided into the four different production methods, as shown in figure 4: cut & sew, fully fashioned, integral knitting, and complete garment.

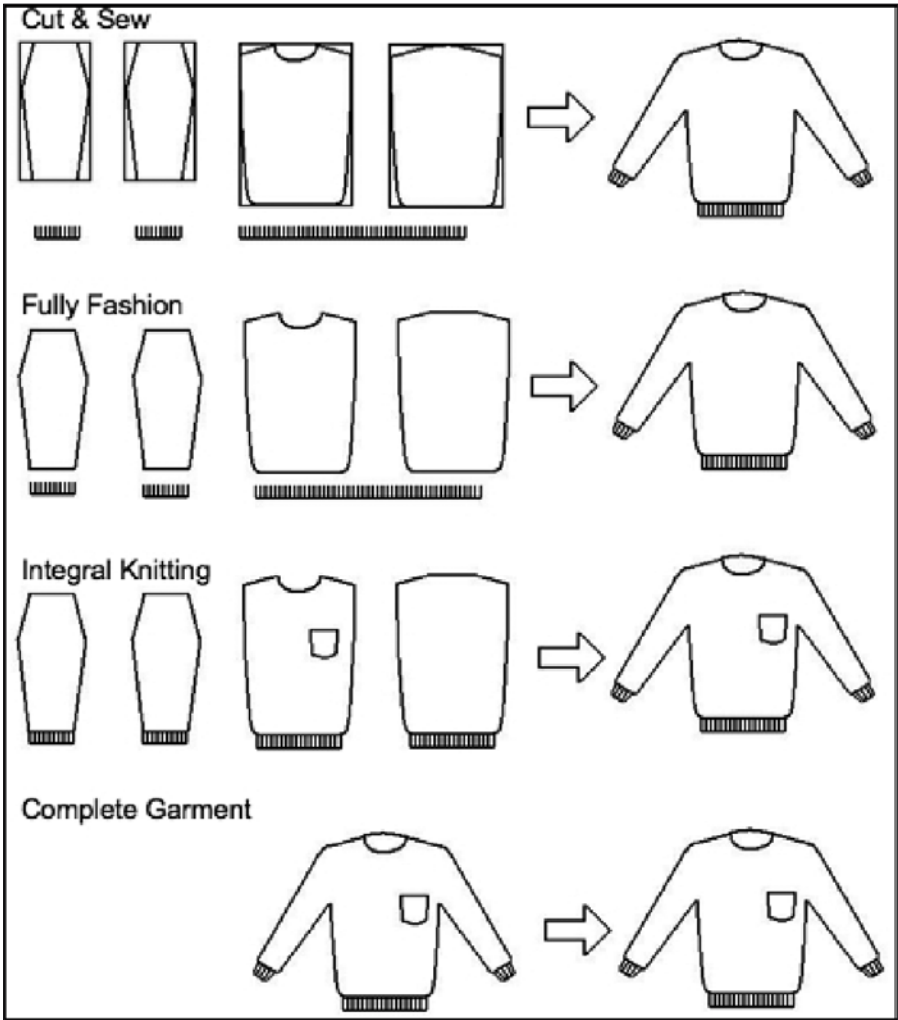


Figure 4. Production methods for flat knitted fashion garments.

Cut & sew is the conventional and most common method for producing flat knitted garments. Panels for front, back, and sleeves are knitted in a rectangular form and then cut into shape in the cutting process. Next the panels are sewn together with separately knitted trimmings and pockets to complete the garment. Both cutting and sewing are post-knit processes that take place away from the knitting machine. With cut & sew, up to 30% of the original fabric may be wasted as cut-loss. The advantage of this type of production is that it can be done in all flat-knitting machines, including old models without computer processing systems. The disadvantages are the labour intensive post-knitting processes such as cutting and sewing, which makes this production suitable in countries with low labour costs, such as Eastern Europe and China. Another disadvantage is material waste in the cutting process. A large fraction of the knitted material is cut-loss, when the right form of the panels is formed in the cutting machine.

Fully fashioned, or shaped knitting, is a method of production, where the front, back, and sleeve pieces are knitted in the right shape directly in the knitting machine. The cutting process is at a minimum or totally eliminated, but some post-knit cutting can still be necessary. Trimmings and pockets are knitted separately and sewn together with the rest of the knitted pieces to complete the garment. The benefit of this production method, compared with the cut & sew method, is that cutting is eliminated or kept to a minimum, and that the material consumption is much lower, due to lower cut-loss. Both material and labour costs are lower than with the cut & sew production method.

Integral knitting means that trimmings, pockets, buttonholes, and other accessories are directly knitted in the fully-fashioned produced panels. With this technique there are fewer post-knit processes such as cutting and sewing. Compared with cut & sew and fully fashioned production methods, savings may be made in both cutting and sewing post-knit processes. Quality and appearance of the completed garment can be improved by this method of integrating accessories in the panels directly in the knitting process. Also, by this production method, cut-loss is kept to a minimum.

Complete garment production means that the entire garment is ready-made directly in the flat knitting machine. The different parts of the garment are knitted in the right shape and knitted together with the trimmings, pockets, and other accessories. As shown in figure 4, the advantages with this technique are many. There is no waste of material such as cut-loss in the cutting process and no expensive post-knit processes such as sewing or cutting. Depending on the style of the garment, some additional cutting and sewing of labels and trimmings may still be necessary. All yarn in the garment comes from the same yarn cones, which enables higher quality and reduces problems with yarn from different dye lots. Due to the seamless technology, the garment could both fit perfectly and be comfortable to wear. This technology makes it possible to reduce processes in the manufacturing of the garment and produce "on-demand" knitting, which can shorten production lead time considerably.

5. Knit on demand – from demand to delivery

5.1 Development of the concept

The research team represent the Swedish School of Textiles together with Ivanhoe AB in Gällstad, a producer of knitwear and SOMconcept, a tailored fashion retailer situated in a top retail location in Stockholm that focuses on tailored fashion and smaller exclusive brands. Production is located in Gällstad in southern Sweden, which has relatively high labour costs compared to the countries where clothes typically are produced. The company producing the garments is relatively small with about twenty employees. It focuses mainly on active wear like golf- and ski clothes. This project focuses on a business concept where the customer is allowed to design his own garment, choose his fit, colour and model and place an order, and one week later the garment is delivered. The customer is not completely free in his or her design, because the quality and lead-times of the production processes have to be guaranteed, so it is more a configuration of pre-engineered modules. Figure 5 is an illustration of the original idea of how a store for customised knitwear would be set up. The original idea was to have a complete garment machine in the store and to connect it to the design systems in the computer where the customer configures or “designs” the garment. However, the business risk of investment in a complete-garment knitting machine was at the end unacceptable for the partners and the best solution was to have the retail store at SOMconcept in Stockholm and the production of the garments at Ivanhoe in Gällstad. This changed the project plan with regard to knitwear production resources, but the collaboration with the partners to develop the concept continued.



Figure 5. Design in Shop.

Development of the concept of the project, design of the garment, production and logistics are very closely related, since the design of the garments has to be flexible enough for customisation purposes and simple enough to keep production costs at a minimum. Design and production of the customised garments were developed together with the two project partners Ivanhoe AB and SOMconcept. Several workshops have been held, where the development of the concept has evolved. Figure 6 explains the role of each participant in the development of the concept.

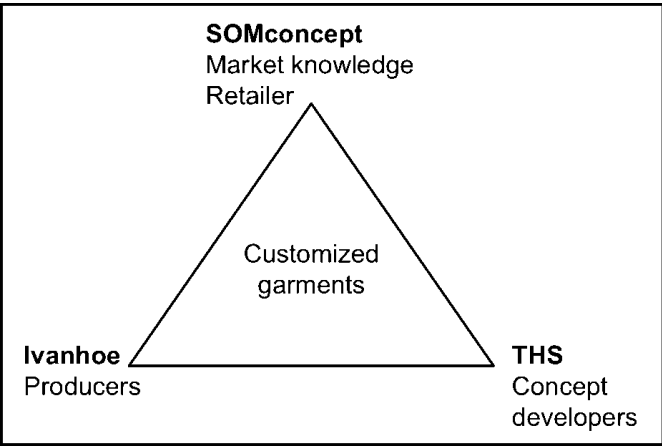


Figure 6. Participants in the development of the concept.

5.2 The logistics behind the scene

The logistics goods- and information flow from supplier to customer can be divided into two flows: product flow and demand information flow. Figure 7 shows the demand chain where the customer comes in to the retail store, in Knit on Demand represented by SOMconcept, and manufacturing represented by Ivanhoe. The yarn suppliers are chosen upon their ability to keep all the season’s colours in stock the entire season and they also provide Vendor-managed inventory solutions, if volumes are sufficient. It is also possible to order special colours but to a higher price for the customer. The lead-time for yarns differs between one and two weeks. As the supplier has a wide range of yarn on stock at all times the agility of the demand chain is assured. There is however a cost associated with agility and if the customer wishes something outside the normal range, he or she will have to pay a higher price.

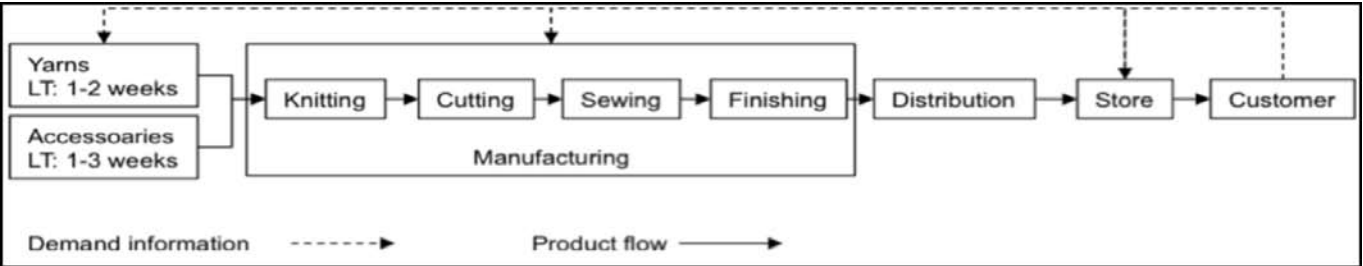


Figure 7.

Figure 7. A demand chain for knitted customised garments.

The knitted garments are made to order and the customer is allowed to (with limitations) customise their garments. The design possibilities have been limited for the customer to change colour, model and pattern. In total five different models (see figure 8) in seven different colours are offered.



Figure 8. Model range, the v-neck is available with two collar depths.

Each garment is made to measure using a system where standard size garments are used as a gauge. In order to fit each customer material is added or removed from the standard size when the garment is produced. The forecasted volumes are quite small in comparison to the producing companies' volumes of regular garments.

The retail price of the garment will be about 1600 SEK. It is from the retailer's point of view better to offer one price for all the models even if the profit margin is higher on a round neck than on a cardigan since less effort in manufacturing is needed for the round-neck.

5.3 Garment manufacturing

Two production technologies were available for producing the garment, Cut & Sew and Fully Fashion. The advantage with fully fashion is that less material is wasted since no material has to be removed after knitting (see figure 9). On the other hand, it can be difficult to knit exactly the right shape of the garment part and this requires longer set-up time in the machine. In order to ensure quality it has been decided to use Cut & Sew technology.

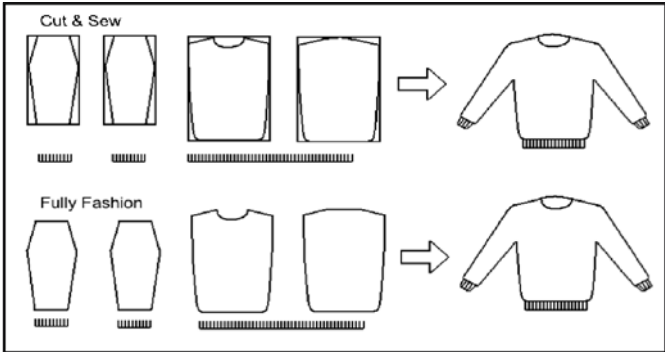


Figure 9. Difference between Cut & Sew and Fully Fashion.

Cut & Sew and Fully Fashion have slightly different logistics solutions. If Cut & Sew is used panels of fabric can be knitted in advance of the customer order point and be kept on stock, which is not possible with Fully Fashion since everything is knitted to order and each panel is knitted to fit one specific customer. From a logistic point of view a Fully Fashion situation would be most beneficial since it minimizes inventory- and handling costs. However, Cut & Sew has its advantages and in this case the Cut & Sew technique has been used due to the following reasons:

- Quality
Washing is carried out before cutting the panels into knittable shapes so when the garment is sewn together it already has the final shape. Since the garments is unique in size it is not possible to sell it to another customer and therefore it was decided that the method that guarantees the highest quality is to be chosen.

- Production
As the panels are cut from a larger piece of fabric it is easier to get the shape right. If Fully Fashion would be used the shape has to be changed in the knitting machine, an equally time-consuming manoeuvre but less safe from a quality perspective. There is no mentionable difference in lead time between Cut & Sew and Fully Fashion, the time-consuming steps are not in production but in the intermediary steps such as trend spotting, forecasting, inventory and long shipment lead-times.

When customers are asked how long they are prepared to wait for delivery they often state around eight days. However, customers seem to be willing to wait longer when they order mass customised products. Whichever is the case, mass customisation of knitwear imposes a challenge on production and logistics. First of all, yarns and accessories have to be kept on stock since their leadtimes are more than eight days. In order to keep the stock at an appropriate level seven colours are available in one yarn quality; the yarn to be used is extra-fine combed merino wool. Secondly, the information flow needs to work flawlessly since there is only one chance to produce each garment. If the garment needs to be changed or if another one has to be produced, most of the profit is lost. It is possible to produce and deliver with shorter lead-times than eight days but eight or nine days is the best lead-time from the producers' point of view. It gives them the opportunity to schedule one day per week on which the garment will be produced and distributed.

6. Main findings

The technology to produce customised garments has been available for many years, but only recently there has been a demand for individualized knitted garments. The theoretically shortest response time for knitwear is three hours but it requires that the knitting machine is located at the same place as the customer. With the production facilities located in Gällstad and the store located in Stockholm an order fulfilment time of one week is more manageable, this is also a lead-time that many customers are satisfied with. When it comes to configuration of the garment it is not possible to offer the customer a completely free design of the final product. In order to guarantee quality and lead-time the modules that the garment is built up from have to be pre-engineered in some way. The multiple-choice system guides the customer towards the final purchase decision and helps the customer visualize the final product. It is very important that the image that the customer creates in his or her mind resembles the end product. The multiple-choice system also limits the customer's wishes to what is possible to produce within a given timeframe and at a certain quality. Regarding the logistics of the project it is rather easy to handle; in the beginning the flows will be narrow enough to fit the existing supply chain. The logistic costs per garment will be higher than in a supply chain of mass products, due to the one-piece flow but the lower risks and increased responsiveness of the supply chain will compensate for that. One of the major issues with producing on-demand is that very few suppliers have channels and systems for demand-driven manufacturing; it means that even if the manufacturing site has the capability to produce on demand, it might be hard to find support up-stream. However, the benefits from reduced risk and the ability to respond faster and more accurately to customer demand make the concept work well.

7. Conclusions

The problem is not the garments customers buy and pay full price for, the problems is the garments that the customer does not buy. Those garments have travelled around the globe for no reason more than taking up valuable shelf space at the retailer. It is the redundant garments that the Knit-on-Demand concept removes from the supply chain. It is however slightly more expensive to produce on demand; production control and order handling does take more time than in traditional production. If the customer can order a garment that suits his or her needs perfectly, either the lead-time or the price is not the order winner. The order winner is the ability to customise the garment. The major benefits for the customer when producing on demand is that the customer receives a garment that better suits his or her needs. Benefit for the company are that they do not have to produce on forecast and overproduction can be held at a minimum. The benefits for the world are that only the garments that are needed are produced. This reduces the emission of pollutants and the use of natural resources.

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As a perception or a dream. Not everything has to be worn to be sensually female.

Exhibitions Reviews

Since 1992, Annie Andréasson works as a journalist at the Communications Office at the University of Borås, specializing in covering the areas of textiles and design.

Photos in the article by Jan Berg, The Museum in Textile History

Nordic Award in Textiles 2008

October 24th 2008 – February 15th 2009

The Museum in Textile History, Borås, Sweden

Annie Andréasson
University of Borås
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Making something complicated look simple and natural is not only among the most difficult tasks ever, it is also very time-consuming. This is shown in the creations by textile artist Anne Damgaard. She is the receiver of the 2008 Nordic Award in Textiles, the most prestigious textile award the Nordic countries offer. For a few months her sensual creations were exhibited at the Museum in Textile History, Borås.

It flows, shimmers, a circular shape is suddenly discernible on the skirt of the dress, it continues up past the waistline and onto the bodice. It is ingeniously devised, every detail is carefully planned. There is nothing superfluous; every part comes with a purpose. The female body is ever the focal point. No visitor ever goes untouched by the exquisitely sensual creations of Anne Damgaard. Is it haute couture or art? And do we have to decide which it is?

– I create something that is in between and try to combine the best of two worlds, the fashion creator's and the textile artist's. My creations do not conform to a specific whim of fashion; they are to last for years and years. They should be no less visually interesting in ten, or even twenty years time. The kind of time I spend making clothes simply does not exist in commercial fashion shows, she explains resolutely.

TANNE DAMGAARD

24 okt 2008 – 15 feb 2009

Den danske designer Tanne Damgaard har i mange år været kendt for sine unikke og ofte provokerende designs. I denne udstilling ses en række af hendes mest betydningsfulde værker, som viser hendes store interesse for tekstil og form. Udstillingen er en fantastisk mulighed for at opleve Damgaards kunst og kreativitet.

Udstillingen er en fantastisk mulighed for at opleve Damgaards kunst og kreativitet.



Her way of working is appreciated, something that is evident from the fine award she recently received. Winner of the most prestigious textile award in the Nordic countries, the Nordic Award in Textiles of 250.000 SEK. Together we walk through the exhibition, which was opened the day after she received the award. Two weeks from now, the light creations will be taken down and moved to the Röhsska Museum of Design and Decorative Arts in Gothenburg.

- Receiving the award was amazing, it was the greatest experience of my life, she says and her voice is warm with emotion; one can tell she means every word.

This time, her work caught the attention of the jury of the foundation Fokus, Borås. However, her artistic clothes were noticed already when she graduated from the Danish Design School. Two items are shown at the Borås exhibition. It was 1997 and already then she was torn over what to concentrate on. She had always been interested in art, while at the same time she liked industrial design. It was the teacher in industrial design, Jan Machenhauer, who made her decide area of specialization.

- He was so good and inspiring and his guidance has meant a lot to me.

Inspired by the Antique sculptures of Greece and how moisture and steam make clothes stick to the body, she developed a draping system where she lets the fabric shape itself tightly around the body. In order to make the fabric feel is if it were wet she chose muslin and nylon fabric that fit tightly and accentuate the torso. To give the dress the right feeling she used water for the design and tied and sowed some parts of it while the material flowed freely from the waistline, but it is not in the least ladylike. That is something Anne Damgaard avoids very carefully. The creation is to feel direct and to be a modern interpretation.

- I still like the clothes in my graduation project, she says proudly.

In Late Autumn Dress Grey made in 1998 she developed her draping system and now she works with a concept. Several layers of bobbinet are shaped like ovals and rectangles which she combines artistically on a pompous skirt, where the bobbinet is allowed space. The multiple layers of bobbinet contrast sharply to the delicate wasteline.

- The exhibition would open in November, hence the dark colors. It is the darkest month of the entire year and on top of that the clothes would be exhibited in a show. I wanted them to be striking on the catwalk and for the audience to have a complete experience, Anne Damgaard explains.

This time, her inspiration was, among other things, 50's fashion and fashion creators such as Christian Dior. As a contrast to various industrial depictions. It is dramatic but also very elegant. The colors shift from greyish brown to turquoise grey. And the result appetizing and appreciated. She sold several creations to shops and one was even sold as a wedding dress.

- The creative process is never easy for me. There lies much hard work behind every detail. I experiment with materials, perform tests over and again. I am often frustrated when things do not turn out the way I expected, although sometimes difficulties subside and it all just flows smoothly, Anne Damgaard explains.

She explains how she is inspired by widely different things. It may be art, architecture, an epoch, or details from nature, an archetype. Constantly photographing, she is always on the lookout for new expressions. She collects her ideas as pictures and she uses them to make on-the-spot sketches for a new topic.

- The digital camera has made my work easier, nowadays I don't have to develop all my photos and instead I can take lots of them. I always carry this or my phone, she says and holds out her tiny pocket camera.





She shows her latest photos, taken while on a winter walk with her family. There are straws of reed protruding from a surface of water, as smooth as a mirror. The icy pattern is graphically clean.

- I am looking to visually capture an atmosphere. Sometimes my mind becomes too full of ideas and that is frustrating, she smiles and shows a movie clip where one can hear her children in the background:

- Mommy, that's enough!

Anne Damgaard always carries her sketchbook where she draws what she refers to as "scribble", on-the-spot images she may return to later in the creative process.

- I photograph my draping experiments on the dummy several times just to have them registered. The photographs are my sketches and I use them to make decisions later on. I often have interesting coincidents along the way before I arrive on my final idea.

Frize Dress of 2001 resembles a flowing rain of pastels. So light, simple and poetic. Or really not only being seen but also perceived, felt.

- Here, I was clearly inspired by a painting by Bernard Frize.

- What is most important to me is probably the aesthetics and to excite emotions in the beholder, Anne Damgaard says.

In 2006 Anne Damgaard was introduced into the world of modern classical music. She was invited to do a exhibition with new works in the foyer of Oksnehallen, Copenhagen. There she met a female electrical string quartet, who introduced her to new classical works by George Crumb. Her dresses were exhibited there so as to give an experience of the interplay between sound, light and video projections.

- Listening to George Crumb's music, which is very rich in contrasts, left me inspired in an entirely new way, a new experience for me.

The contrast between light and dark elements is very clear. A new dimension is present in Black Angel Brown, one of the thirteen creations she created when inspired by the classical pieces. Seven of them are exhibited in Borås.

- I wanted to transform a shape and began to paint, instinctively choosing ink. The images came clearly to me through the music and it felt among other things like a spiral shape, Anne Damgaard explains.

The spiral shape is easily noticeable. Sometimes as a circle that winds like a shell between the dress and the world around it. It all begins as a wide bicolored dress, on which the circular application winds its way, it feels almost three-dimensional. The video recording that was produced for the exhibition shows the women in the string quartet wearing four variants of Black Angel – one red, one pink, one blue, and one green – to match the colors of their instruments. The recording is also displayed in Borås. It is a entirely different experience to watch the creations worn on a female body while hearing the music that inspired Anne Damgaard. All of a sudden, the wheel has come full circle.



In Ann Damgaard's latest works created for the Borås exhibition a more intrusive working style is visible. These creations are found at the very back of the exhibition and the visitor has to see all the earlier creations to reach them. There is most likely an idea behind this. Nothing Anne Damgaard does lacks purpose. One characteristic is that they are all about abstract body-shaped sculptures.

- I have tried to move from something concrete and massive to something diffuse. The materials are the same for them all, as is the groundwork. Today, I am probably more occupied by nature than I was before, she confesses in a musing tone and runs her hand along one of the creations.

It is tube-shaped bobbinet lace. The introduction to the exhibition states that it was a quill from a porcupine that inspired Anne Damgaard to use the pointed straws that make up the shape of the creations. They may however appear entirely different if they are woven to form a pattern or are given flowing shapes almost like a corset. Sometimes one is not certain if one is seeing the item from the right or the wrong side.

Anne Damgaard is not afraid to try the classic and remake them. It does not matter to her if it is about the boundaries of the classical dress or modern art. It is something entirely new – something in-between - that we do not have a word for, because we have not seen it before.







The jury of the most prestigious textile award in the Nordic countries had long been eyeing Anne Damgaard's work. In 2008 she received the much desired award. Her work of more than ten years is shown very effectively at the Museum of Textile History, Borås. The creations are exhibited on female torsos suspended from the ceiling; by that Anne Damgaard shows that they are not fashion garments but artistic creations.

Facts:

Anne Damgaard
Born: 1968 in Silkeborg, Denmark. Lives in Copenhagen.
Education: 1992-1997, the Danish Design School.
Last award: 2008 Nordic Award in Textiles,
Foundation Fokus, Borås, Sweden.

Voices on Anne Damgaard

Margaretha Persson, chairperson of the jury of the Nordic Award in textiles and assistant director at the Museum in Textile History:

Anne Damgaard's creations are characterized by a sensual elegance and great craftsmanship with many complicated constructions and time-consuming drapings.

Excerpt from Erik Steffensen's description of Anne Damgaard's 2004 exhibition:
Anne Damgaards design opens for a dialogue with the world of dreams. But the dresses are real. You don't notice if you don't happen to know – but princesses are also a kind of people.





The Textile Research Centre



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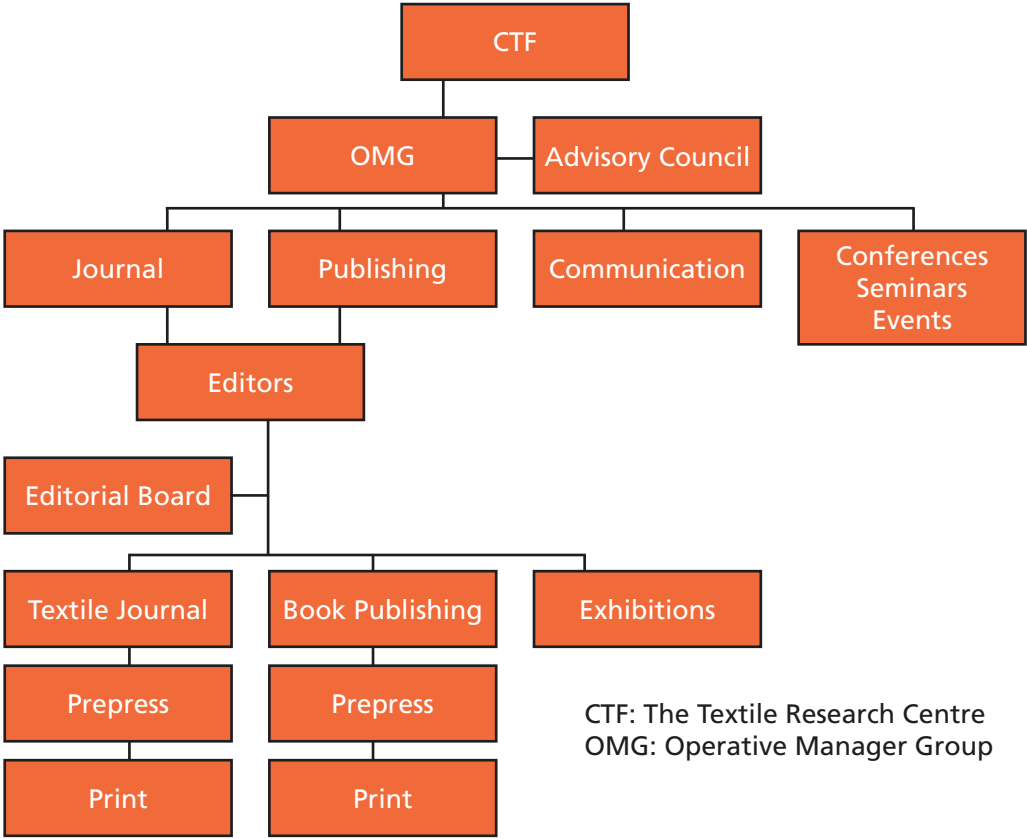
Since its start in 1998 the Textile Research Centre, CTF, has worked to gather international and national actors who want to reinforce research in the textile and fashion sector. The CTF is attached to the Swedish School of Textiles, THS, at the University of Borås. Through active work the CTF is now of central importance to the research and the artistic development work carried out at the Swedish School of Textiles. Seminars, conferences, publication of journals and other works, and creation of research networks are items from the program.

Today (2009), the Swedish School of Textiles has some 10 professors and 20 postgraduate research students. Its intentions are now to develop and strengthen the CTF as an arena and as part of the infrastructure for research and artistic development work. To achieve this, a re-examination of activities, organization, communication, and financing has been carried on.

Purpose

The purpose of the activities of the CTF is to promote Nordic research in textile and fashion through making research results and information available to all professional groups in the textile field. The CTF strives to provide an overall picture of this kind of research by highlighting design and craft as well as technology and management and the unique combination of these subject areas represented by the the Swedish School of Textile and its partners. Thus, CTF activities include hosting lectures, seminars, and conferences along with reflecting current issues and presenting discoveries through publications and contacts with the media.

Organisational Scheme of the Textile Research Centre, CTF



CTF: The Textile Research Centre
OMG: Operative Manager Group

Areas of Interest and Research:

Design	"The development of innovative design with the help of modern technology giving consideration to environmental, estetic, financial and ethical requirements".
Textile- and Design Management	Design management, fashion logistics, humanistik marketing, design direction
Crafts	Historic textiles
Textile Technology	Environmental technology, technical textiles, fibre technology

CTF, Advisory Council

The aim of the membership of the CTF, Advisory Council was to create close links within the field of textiles relevant to the work of the CTF. The first board meeting was held on August 31 1998.

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The textile research board at Swerea IVF, Textiles and Plastics Department

Pernilla Walkenström	Adjunct professor in Textile Technology at University College of Borås, The Swedish School of Textiles. Manager at Textiles and Plastics department, Swerea IVF. Finished her PhD 1996, focusing on “Phase distribution of mixed biopolymer gels in relation to process conditions”. Has since then worked with biopolymers, gel formation phenomena, followed by fiber spinning processes.	Staffan Toll	Senior scientist at Swerea IVF. Professor of Fibrous Materials at Chalmers, since 1995. Research revolves around the micromechanics, rheology and constitutive theory of fibre networks, suspensions and composites.
Bengt Hagström	PhD in Mechanical Engineering. Expert on polymer processing, polymer melt rheology and melt spinning of fibers. Manager Functional fibers group at Swerea IVF.	Martin Strååt	PhD-student at Swerea IVF. Master of Science in polymer engineering materials in 2005. Licentiate in polymer engineering in 2008 on dielectric properties of polyethylene foams. Currently working on developing new conductive fibers for smart textile applications.
Anna Thorvaldsson	PhD-student at Swerea IVF. Finished her Master of Science in biotechnology in spring 2006. The studies focused on biopolymers (DA-work) and molecular biology. Has thereafter worked with electrospinning of nanofibers for biomedical applications.	Valter Dejke	Licentiate in engineering in 2001 on durability of fibre reinforced polymers in concrete. Has since worked with development and production of chemical type humidity indicators. 2008 he was employed as a researcher at Swerea IVF where he focus mainly on mechanical and thermophysiological properties of textile materials.
Anders Bergner	Senior scientist at Swerea IVF. Polymer material engineer in 1987, then studied innovation engineering 1989-1992. Has long industrial experience in the field of polymeric materials, composites and textiles from automotive-, defense- and medical technology as design engineer, project manager, R&D manager and technical manager.		
Ioannis Chronakis	PhD in physical and colloidal chemistry of biomacromolecules. Expert in electrospinning of functional nanofibers and micro/nanostructures.		
Jonas Engström	Senior scientist at Swerea IVF. Finished his PhD in 2006 with a thesis titled “Functional copolymers of polyvinylpyrrolidone”. Has since then worked with electrospinning and crosslinking of polymers. Expert on material science with a specialization in polymer organic chemistry.		

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Refereeing

Submitted article manuscripts will be peer reviewed by at least two referees appointed by editorial board. Article manuscripts can be either accepted as submitted, accepted after requested major or minor modifications or rejected by the editorial board. Submitted images of research objects will also be scrutinized by experts appointed by editorial board, after their statement, accepted or rejected by the editorial board.

Submitted exhibition reviews and book reviews will be subjected to an editorial assessment.

Free access publication

The journal will be published electronically, with free access, six months after the publication date of the printed issue. The electronically version will be published in University of Borås institutional repository BADA (Borås Academic Digital Archive) <http://bada.hb.se/> .

Guidelines - articles

- Submitted article manuscripts should be original articles, written in English. They must not be published in the same form earlier or submitted for publication elsewhere.
- The text should be submitted in two copies: one editable copy and one non editable copy in appropriate file formats.
- Photos and other images should be supplied as separate files in an appropriate file format.
- It is the author's responsibility to obtain the required approval from all the parts involved: authors, photographers, artists and others.
- There is no page limit specified for contributions, but it is recommended that the material is presented in a form that is succinct and attractive to read.
- An abstract of no more than 250 words should be supplied as well as 5 essential subject keywords.

- A biography of 3-5 sentences for each author should be supplied as a separate file.

- References should be in Harvard style (the "name-year system"):

Example, books

The reference:

(Finnane 2008)

In reference list:

Finnane, A. (2008). *Changing clothes in China.*

Fashion, history, nation. New York. Columbia

University Press.

Example, book chapters

The reference:

(Breward 2001)

In reference list:

Breward, Ch. (2001). Manliness, modernity and the shaping of male clothing. In: Entwistle, J. & Wilson, E. (eds.). *Body dressing.* Oxford. Berg, pp.165-181.

Example, journal articles

The reference:

(Studd 2002)

In reference list:

Studd, R. (2002). The textile design process. *Design journal.* Vol. 5:1, pp. 35-49.

Guidelines - exhibition reviews and book reviews

For book reviews, bibliographic information should be supplied: author(s), title, publisher and publication year.

For exhibition reviews, name of originator(s), title, location and dates of the exhibition should be supplied.



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