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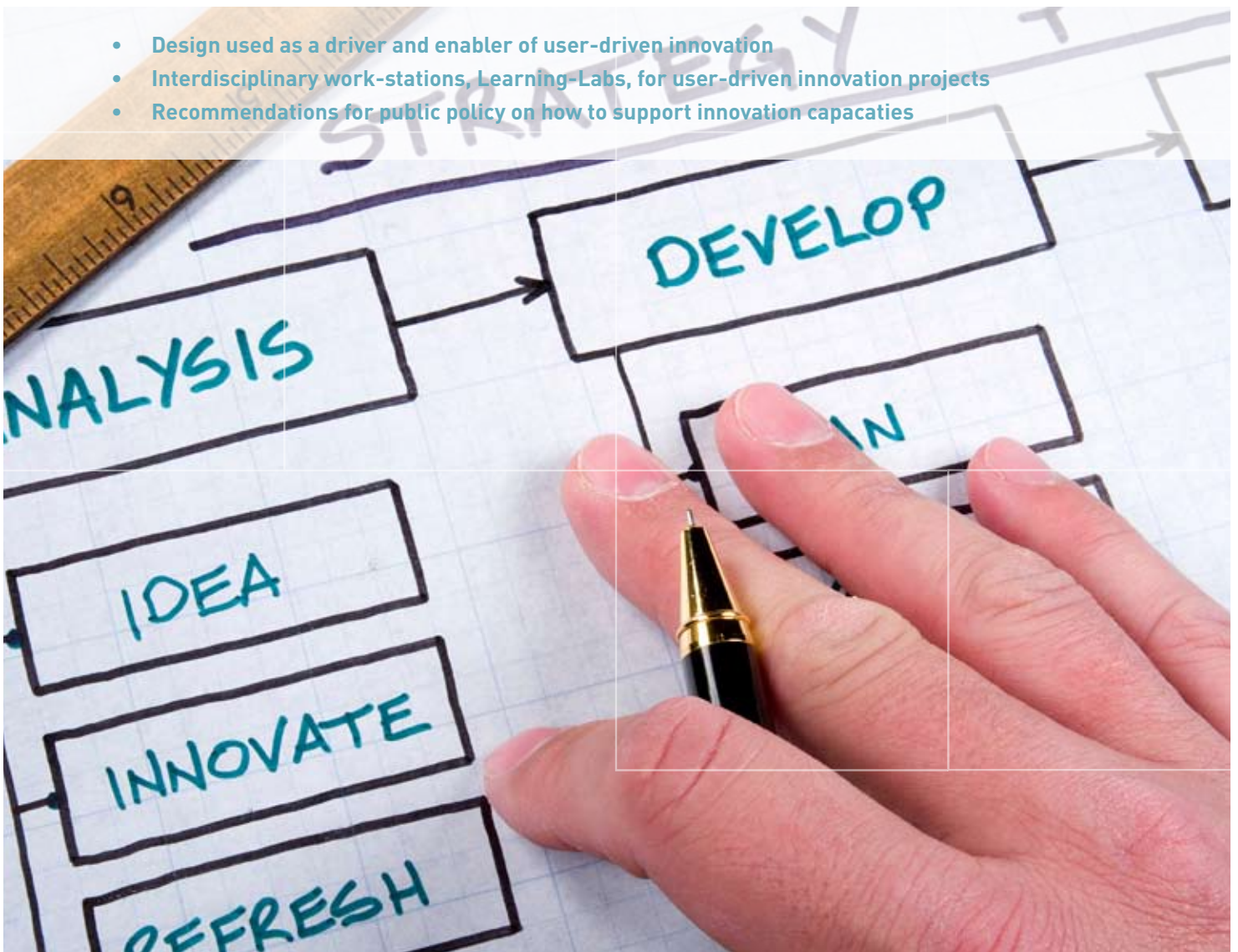
Nordic Innovation Centre

May 2010

LUDINNO

- Learning-Labs for User-Driven Innovation

- Design used as a driver and enabler of user-driven innovation
- Interdisciplinary work-stations, Learning-Labs, for user-driven innovation projects
- Recommendations for public policy on how to support innovation capacities



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Learning-Labs for User-Driven Innovation (LUDINNO)

May 2010



The Organizer



save time...

The Exciter



kill time...

Harmony



catch the moment...

Title: LUDINNO - Learning-Labs for User-Driven Innovation		
Nordic Innovation Centre project number: 07100		
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Abstract: LUDINNO a hands-on user-driven innovation-project, has provided new concepts, ideas and knowledge for businesses, and a platform for a Nordic research cooperation in the field of merging design and user-driven innovation (UDI) processes. In the project students supported by academics and trained professionals cooperated with businesses to carry out real and user driven business projects. The project name, LUDINNO, stems from the Latin word ludo, meaning –to play- and innovation, implying, “to engage in innovation in a playful way”. The projects main objective was to allow participating companies and consultants, to test, experiment with, and then implement methods for UDI in their business operations. These playful laboratories were called Learning Labs, and used multidisciplinary teams consisting of users, company employees and students. Five Learning Labs have been conducted, in Karlstad, Oslo, Helsinki, Linköping and Aalborg. All together, projects in the five learning-labs have engaged 30 companies as primary stakeholders, over 100 students, and innumerable number of users. All the Learning-Labs experimented with and implemented a range of different types of design-skills or methods. The project-partners have met across the projects to discuss, exchange and generate new knowledge. This report describes the setup and results from each of the five Learning-Labs. It also provides practical ideas about how design can be used in UDI-projects, and recommendations for which way public policy in the Nordic countries can support innovation capacities.		
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Distributed by: Nordic Innovation Centre Stensberggata 25 NO-0170 Oslo Norway Phone: +47-47614400 info@nordicinnovation.net This report can be downloaded free of charge at www.nordicinnovation.net		Contact person: Tomas Edman Innovation and Design manager (LUDINNO's Project manager, on behalf of SVID, Swedish Industrial Design Foundation) Dotank AB Sommargatan 115 SE-56 37 Karlstad Sweden tomas@dotank.se

Executive summary

Objective

- To allow participating companies and consultants to work together, as a playful laboratory, to test and experiment with, and then implement methods for user-driven innovation in their business operations. This process occurs through Learning-Labs involving multidisciplinary teams of users, company employees and students working on real projects.

As secondary objectives we identified:

- To explore how industrial design processes, methods and skills can be used and refined to contribute to UDI-methods.
- To explore how UDI-methods can be implemented in design-processes in the form of enhanced user-focus and involvement.

LUDINNO a hands-on user-driven innovation-project, has provided new concepts, ideas and knowledge for businesses, and a platform for a Nordic research cooperation in the field of merging design and user-driven innovation (UDI) processes. In the project students supported by academics and trained professionals cooperated with businesses to carry out real and user driven business projects.

Method and implementation

A Learning-Lab was a pre-defined, restricted period of time where real projects were carried out through a co-operation among students, professionals and academics. We used design and UDI methods to ensure that the different projects were conducted either in a user-driven way based on users needs, or in a user-innovation way based on users ideas and solutions. The overall method used can be described as action learning in the sense that we used the projects as the base for learning and training for students, businesses as well as for providing empirical situations to academic research.

Results and conclusions

All together the five learning-labs engaged 30 companies as stakeholders in the projects, over 100 students as contributors and performers, and innumerable number of contacts with different types of users affected by the different projects.

Statistics

- 5 Learning Labs in 4 Countries.
- 30 Businesses directly involved as stakeholders
- 100 students as participants
- 75 concepts or conceptual ideas for participating companies. (The number could be larger because some ideas were given to business directly and are not included in the report)
- Innumerable, direct or indirect contacts with users.

The Ludinno project has provided the following benefits for the stakeholders.

Businesses:

- Concepts and ideas for business development.
- Opportunities to meet and engage with students and universities for co-operation.
- Opportunities to, encounter, practice and derive new knowledge on how users can get involved in their own innovation system.

Students:

- Opportunities to work on real business projects.
- Opportunities to work in multidisciplinary teams.
- New academic knowledge to integrate with their previous knowledge from studying, design, business administration, engineering or something else.
- Therefore we can say they are better prepared for the working life, which they also say in their evaluations.

Participating universities:

- A Nordic network of competence in the field of design/UDI has been established.
- Developed an effective module for inter-disciplinary work and interaction with businesses and organizations.
- Generated a valuable empirical material for research and publications.

The Ludinno project has an after-life in all participating universities.

- In Karlstad a master-course named User-innovation is established. The course is now running for the second time, and a third is planned for in 2010.
- In Aalborg a second Ludinno workshop has been conducted. The promising results of the video-sketching methods from these two labs are now brought forward in co-operation with Stanford University.
- The Oslo School of Architecture and Design (AHO) continued with the persona approach from the learning lab in 2009 within the design course: V08IDES1 Design som tjenesteyting, Personas: utvikling og bruk i produktutvikling. AHO also presented the Ludinno project at two conferences: 7th NORDCODE Seminar & Workshop, Lund University, Sweden and 6th Conference on Design & Emotion 2008, School of Design, The Hong Kong Polytechnic University, 6-9 October 2008 (see reference below).
- In Linköping the course “User driven product development” is a mandatory course since 2007 for Design and Product Development students, results from the LUDINNO project is weaved into the Vinnova-funded ICE-project, and co-production co-operation with major growth initiatives in the region is under development.

Conclusion

The understanding and use of design in business is changing from being associated with aesthetics and function of products. The concept of design seems to be moving towards design being an essential activity for user-centered innovation. A new terminology including labels as strategic design, design management, eco design, service design, design for all and of course design thinking is rapidly developing.

The results of Ludinno indicates that, existing design practice and the rapidly changing role of design in business, is co-existing and coherent with the like-wise growing attention on UDI and that design can be used as a driver and enabler of user-driven innovation.

Design schools can provide inspiration for developing innovation education and how to transfer knowledge based practice between businesses and universities. We report work from design-programs in, engineering schools, universities and design schools. Common to all these, is a practice capable of bringing scientists, researchers, students, and companies into the same process of using design and user-focus as the means to discuss problems and imagine new solutions together.

The results from the Ludinno project show that innovation thrives from working in multidisciplinary teams. Results also show that design can and will enable a user focus in innovation-processes. They also show that places of practice, Learning Labs or Do Tanks, rather than think tanks, are valuable resources in creating innovation capacities.

Recommendations

1. Establish interdisciplinary workstations or Do Tanks for User-Driven-Innovation at universities.

Universities, policy-makers and research funding should work together to establish platforms or workstations for interaction and co-operation in udi-projects. We call these platforms 'Do Tanks' because we believe in places of practice. The purpose of a Do Tank is to run practical UDI projects connecting businesses, students, academics and professionals with the needs, dreams, ideas and inventions of users.

The expected out-put of Do Tank are innovations for market use and young professionals trained and skilled in inter-disciplinary work and UDI. Additionally, Do Tanks can provide a platform for co-produced research between Universities, businesses and organizations. A Do Tank is preferably organized as a co-operation between business, engineering schools and design schools. It should have a close co-operation with business-associations for both funding and operation.

2. Coordinate National, Nordic and European design policies

The Commission of European Communities is at the moment producing a policy for "Design as a driver of user-centered innovation". They conclude that Design has the potential to become an integral part of European innovation policy and suggests the following as a starting point for discussion in arriving at an operational definition for policy development.

"Design for user-centered innovation is the activity of conceiving and developing a plan for a new and significantly improved product, service or system that insures the best interface with user-needs, aspirations and abilities, and that allows for aspects of economic, social and environmental sustainability to be taken into account."

We believe that the results of Ludinno shows that existing design practice and the rapidly changing role of design in business co-exists and is coherent with the like-

wise growing attention on UDI. Therefore we suggest that the Nordic and national policies on innovation, UDI and design should be coordinated and connected to the European proposal.

3. Reform Nordic design education

There is a lack of professionals with the appropriate skills making UDI/design a strategic advantage in the global market. We challenge design-schools to create programs that focus the changing role of design. These programs should educate through a combined theory and practice approach. This could mean involving business-management, entrepreneurship as well as new concepts of design as design-thinking, user-centered design, udi etc.

It is however important to understand that the concept of design and the coherent UDI still is in rapid development wherefore there is a need for design-schools to become and stay innovative in developing Nordic design education.

4. Integration of design/UDI in business and engineering-schools

We recommend that education in design/udi practice should be an integral part of business and engineering schools. We believe as above, that if udi is to be used as a strategic advantage, businesses will not only need skilled professionals in design and innovation, but also executives trained in how to use these tools perfectly. Therefore we suggest that design/udi should also be made an integral part of business and engineering schools.

5. Create intermediates for user-validity in research-projects

Design has the potential to make products or services user-friendly and appealing. Design “closes the innovation loop” from initial research to commercially viable innovations and, as such, has the potential to increase efficiency and add value to the overall R&D and innovation spending. We believe there is a need to use UDI-methods as input to R&D booth in business as well as in universities to provide more focus and input from users already in the start of research-projects. We also believe design and user-perspective is needed to develop research results and ideas into innovations. We suggest research-funding organizations should look for and invest in R&D projects where there is a clear and established intermediate role that insures the user-validity in research and creates innovative value in the output.

6. Nordic UDI-project on social or public innovation

In some of the projects conducted in the Ludinno Learning-Labs we discovered people’s needs, ambitions and interest to engage in developing public or co-operative services and values.

We can see an emerging European trend to conduct udi-projects involving users to innovate in public or co-operative systems. Topics might include sustainability, recycling, growing of foods, transportation, care for elderly etc.

We believe that there is a need for Nordic user-driven projects on social innovation. Innovations derived from such projects will create value and save costs in the public system and provide a platform for innovations on products and

services brought to market. Projects in this field have a great potential to communicate and build a platform of understanding of UDI on a broader scale.

Therefore we suggest that NICE should be engaged in and support projects in this field.

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1 Introduction

LUDINNO has provided new concepts, ideas and knowledge for businesses. And at the same time provided a platform for Nordic research cooperation in the field of merging design and user-driven innovation (UDI) processes. In the project students supported by academics and trained professionals cooperated with businesses to carry out real and user driven business projects.

The project name, LUDINNO, stems from the Latin word *ludo*, meaning –to play- and innovation, implying, “to engage in innovation in a playful way”. The projects main objective was to allow participating companies and consultants, to test, experiment with, and then implement methods for UDI in their business operations. These playful laboratories were called *Learning Labs*, and used multidisciplinary teams consisting of users, company employees and students.

Five Learning Labs have been conducted, in Karlstad, Oslo, Helsinki, Linköping and Aalborg. All together, projects in the five learning-labs have engaged 30 companies as primary stakeholders, over 100 students, and innumerable number of users.

All the Learning-Labs experimented with and implemented a range of different types of design-skills or methods. The project-partners have met across the projects to discuss, exchange and generate new knowledge.

This report describes the setup and results from each of the five Learning-Labs. It also provides practical ideas about how design can be used in UDI-projects, and recommendations for ways public policy in the Nordic countries can support innovation capacities.

1.1 Action-Learning

One strong belief in the Ludinno project was that innovations as well as new knowledge is better created in co-operation and multi disciplinary work. Therefore we used the art of doing things as the heart of the project. From doing and acting in the different sub-projects we were able to create learning situations for all stakeholders including the partnerships representatives. The process to achieve this can be described as circular and using the following steps, -what and how are we going to do, - do it, -reflect, learn and set new task, and then start over again. This way of working proved to be very valuable and is of course very much influenced by action-learning processes.

This way of working became so important in the project that we started to refer to the learning-labs as Do Tanks. Do Tanks in sense that doing things and acting instead of just thinking about them is the basic ground for creating innovations.

2 Learning-Lab/Do Tank Karlstad

Written by Tomas Edman, SVID

2.1 Background

This Lab was the first one in the Ludinno project and performed already in the summer of 2007. The Innovation & Design program at Karlstad University had in previous years set up summer schools in cooperation with the local SVID, Swedish Industrial Design Foundation, branch-office of Designstudio Värmland. In these summer schools students from different backgrounds were invited to train design-, processes, skills and methods in multi-disciplinary teams. They trained both academically and practically by working on real projects supplied by businesses. By this way of working it was also possible to contribute to companies not only with good and valuable project-results but also to opportunities for businesses to train and develop their own design capacities.

Our ambition in the Ludinno sponsored learning-lab/Do Tank was to develop the concept further. We wanted to achieve a closer relation with participating companies and maybe even more importantly we wanted to transform and develop our concept from a design perspective to a user innovative perspective. To be able to do this we had to broaden the partnership producing the learning-lab. The Learning-lab was produced by a partnership with the following partners.

Karlstad University.

Responsible for giving the academic training and providing the research background to the Learning Lab. Through Ludinno we managed to get a multi-disciplinary approach to our topic of user-innovation. From the universities side the lab was co-produced by the “Innovation & design program” and “The Service and Research Center, CTF.

Designstudio Värmland.

Designstudio Värmland was responsible for involving business into the Learning-Lab, and for supervising the projects in co-operation with the participating companies.

The Packaging Arena Business Association.

Owner of Designstudio Värmland and therefore involved in finding business willing to take part in the Learning-Lab. The Packaging Arena were also providing financially in the lab through their ongoing- EU “mål 2” project.

SVID, Swedish Industrial Design Foundation

SVID contributed with finances and Nordic network established through the Ludinno project. Designstudio Värmland was at the time the local branch-office for SVID in Karlstad.



Students working in the Learning-Lab, Karlstad

2.2 Students and businesses

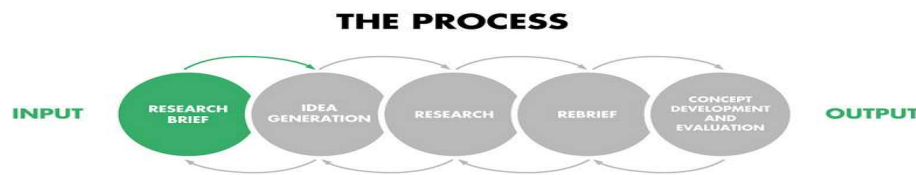
The Lab was based on a 10-week course given by Karlstad University at bachelor level and open to students from all fields of education. All together 14 students took part in the course with backgrounds in industrial design, graphical design, marketing, business administration and engineering. The students were from all together three universities within Sweden.

Four businesses, Stora Enso, Tetra Pak, Löfbergs Lila and Engelsrud Emballage AS, were involved as stakeholders and co-creators in the learning lab. The Businesses contributed both financially and in time by taking an active part in the projects.

2.3 Method

Very often design is used by business to create attractiveness for consumers in products or services. This will mean that design is predominately used in the later part of a innovation-process and that the designers skills of involving users are used in focus-groups, market-research and in the art of putting the final touches regarding shape, form and communication of the end-result.

In the Lab we wanted to challenge this and explore how we could use design earlier in the innovation-process. We also wanted to challenge designers to be more open to user-driven innovation and not only focus on the end-result. Instead of using a traditional design-process starting with a brief going to research, idea-generation, concept-development and presentation, we created and tried to implement a reshaped method.



The reason for setting up and starting the projects with a research-brief instead of design-brief was to open up the projects to be more innovative and based on user-needs or user ideas. Were design-briefs often are closing in the sense that they are already from the start giving the targeted consumer-group, the targeted marketplace, the targeted way of distribution, the targeted communication, values etc, we now could start our projects by exploring and involving users.

We also wanted to take in to process our belief that good ideas can come at any time in the process, and therefore we also put the idea-generation faze of the process as early as possible.

We also created in cooperation between David Lindeby at Designstudio Värmland and Martin Löfgren at Service Research Centre at Karlstad university a tool to find and describe uses needs, ideas and trends to be used in the early faces of the innovations process. The tool is called ISR, InterSpeedResearch. This tool was used in all projects by students and has later been brought into use also in business projects.

InterSpeedResearch™

MARK THE SPOT:

Hotel/hostel
Mass transit
LCD-Screen
Street
Store
Restaurant
Your choice

PLACE:	DATE:
DESCRIBE WHAT'S HAPPENING:	
WHAT / WHO ARE YOU OBSERVING / INTERACTING WITH?	
WHAT MAKES IT INTERESTING AND DIFFERENT?	

DOCUMENTED WITH:

☐ Photo
☐ Sound

☐ Video
☐ Other _____

PUBLISHED ON www:

ISR-tool, created for the purpose to collect user information in the research-phase of the project.

To support communication between all stakeholders involved we used a communication-tool as part of the method. It was a simple blog-function at the web-address www.userinnovation.se. At this address you can still find all the work put down in the projects.

2.4 Projects and process

At the start of the projects we set up the different research-questions used in the projects. The questions had to be open to be able to involve users, but also connected to the needs of the business involved. We used the following questions.

For Engelsrud Emballage, -What fashion styles do city dwellers have? Describe the attributes.

For Löfbergs Lila,- What do city dwellers consume to improve their health?

For Stora Enso, - How are fruit, vegetables and plants used by city dwellers

For Tetra Pak - Find and examine situations where beverages/liquids are consumed “on the go”.



ISR-tool: the research-question.

The research was performed in different ways. By interviews, focus groups, questionnaires using the ISR-tool etc. Research was conducted at different locations and on different user-groups according to the projects needs.



The teams traveled for research to London, Barcelona, Milan and Paris conducting interacting with users on chosen locations and spots in these cities.

After working through the research and analyzing and presenting the material to the Businesses the research-briefs were transformed through a rebreif into more traditional design-briefs.

For Engelsrud Emballage- The package should be made from 100% paperboard, easy to open and be suitable for a handbag, pocket or bathroom.

For Löffbergs Lila - What concept should we concentrate on to keep up with the health trend?

For Stora Enso - How can people grow food in an urban environment?

For Tetra Pak- Develop a new packaging concept that includes a straw for adults “on the go”.

2.5 Results

After setting up the projects with open research-briefs, and performing user-interactions, all the way through process of actually producing concepts and solutions we ended up with interesting results. We can in hen-sight see and learn that we need to develop a more sophisticated method and setup of tools to actually be able to implement the concepts developed with users. We need to find a better way to transform user ideas and needs into valuable innovations and business for the involved companies.

Of the four projects we ended with one going into the process of patenting the solutions. One project came up with on what the company described as highly interesting and radical, but to radical for core-business to handle.

One project ended with concepts that underlined other ideas and innovations that company was already working on, and finally the last project could be described from the companies point of view as a disaster and un-interesting. The reason could be in the last case that the concepts for sure were user-innovations and based on real user-needs, but just was not in any way in scope of the company involved.



Pictures of concepts for Engelsrud Emballage and Löffbergs Lila.

One other result from Learning Lab/Dotank Karlstad is the inspiration and platform for cooperation it gave for the future. Since the lab was conducted the work and co-operation between the partnerships has developed.

In 2008 Karlstad University gave the course “Userinnovation” on a master-level. We believe that the course was the first of its kind in the Nordic countries and is now running for the second year. From the first year the number of students has gone from 9 to 22 and we are higher for the third one in 2010. In 2010 the ambition is also to further develop the course into contract training for businesses to attend.

The projects are now longer which means that we can see a higher success-rate in concepts actually reaching market. Since the Ludinno sponsored Lab there has now been an additional 8 companies from Sweden and Norway taking part in projects.

The platform of the master course has also been able to give valuable insights and inputs to the academic research at Karlstad University and is often described as best practice on multi-disciplinary work and co-operation between academia and business.



Design-teams meet at the office of Designstudio Värmland.

3 Learning lab/Do Tank – The Oslo School of Architecture and Design

Written by Martina Keitsch and Tom Vavik

3.1 Introduction and background

In design, experiences, emotions, knowledge and aesthetic practice merge for both the designer and the user. In the last decades the scope of the design field has successively changed - from a focus on material aspects to a focus on the intangible, from functions to pleasure, from goods to services and values (Jones 1997, Pine, Gilmore 1998). At the same time, concerns have been raised regarding how well designers' conceptions of product symbolisms; user experiences etc. match those of the user group. This creates the need for innovative methods and tools that combine quantitative measurements with interpretative and narrative ways to communicate with users (Desmet 2002, Green and Jordan 2002).

Industrial design is *per se* a process, which focuses on users, their values, their experiences and their cultural contexts. Training students to understand different views and sensitize them to integrate users' experiences in the product development process has been one goal of the Ludinno project (Keitsch, Hjort 2008). The project aimed to explore how industrial design processes, methods and skills can be used and refined in a way to contribute to User-Driven Innovation. The project also explored how User-Driven Innovation methods can be implemented into design processes in the form of enhanced user-focus and involvement in different stages.

In the project AHO collaborated with Karlstad, Aalborg, and Linköping University in establishing learning labs. AHO interpreted the learning lab as a possibility to test, experiment and implement novel methods for user-driven innovation within practical cases from the participating companies. The participating companies were: Luxo ASA, Snøhetta, Dedicated Sound, Opera Software, Second Brain, Molift Group AS, Tokvam AS, Frost Produkt AS, Norsk Filminstitutt, Northern Lighting, MSale AS and Scanship, (see list on page 3). The companies represented thus a variety of product and service design areas with specific needs and user features. The companies were supposed to designate a contact person and work out a design brief before the project started. The design brief should contain background, problem definition, product requirements and other considerations and limitations.

A main driver in design is to translate or interpret people's needs and wishes into desirable product attributes (Verganti, 2003). In design research and education the focus for methods to explore users' needs has changed successively in the last decades, from positivistic towards social science inspired approaches that have more affinity with design processes than the science/engineering model. Employing these thoughts for user-centered design implies for example to abandon a more or less tacitly accepted view on the determinability of users' feelings through a designer and finding new ways to describe the user-product nexus (Richardson 1993).

The cooperation between the companies and the participating students in the AHO lab should make both realize the importance of co-design (designer, producer, user triad) with emphasis on learning from each other and on “reflection in action” ([Schön 1995](#)), further, the AHO lab should contribute to promote user-centric, interdisciplinary, iterative methods and tools in order to make usable products, applications, environments. Firms and governments are increasingly interested in the value of user innovations for commercial and social advantage (Kristenson et al, 2004). The academic and didactic aim of the course/lab was thus to improve methods of meeting customer needs.

3.2 The AHO Learning Lab

3.2.1 *Our rationale*

The designer has to ride two horses at the same time; she must take into consideration both the company she works for and the end user. These two perspectives complement each other, since an important part of a profitable and good selling and high quality product is usability. To develop the requirements of/to usability an analysis based on the following three questions is essential:

- 1) Who are the users and what are their characteristics and needs?
- 2) In which context and environment is the product to be used?
- 3) What are the different tasks the product and user are going to fulfill?

Bringing the user into the design process is also a rich source to new thoughts, creative ideas and concepts.

Working with user involvement challenges not only students but also teachers. Teaching students to consider users in the design work is not an easy task, especially because it is often connected with tools and methods from different areas within the humanities and social sciences as well as in natural sciences and engineering. A goal of such a comprehensive education must be that students learn to consider several relevant aspects related to a product- or service solution. The AHO Master Students course, which the Ludinno lab was part of, was aiming to help the students developing a new understanding of what is normal or appropriate product use. This understanding has its starting point in a common sense perception and moves to a more professional one, where the designer realizes the challenges that users face using products and services.

3.2.2 *Our method*

The Ludinno learning lab was part of the studio course for Master Students titled: “Design as a service for organizations and companies”, where students, who had passed the 6th semester, did a design project in cooperation with an organization or company of their own choice.

The course has the aims:

- To familiarize the students with different aspects of working professionally as an industrial or an interaction designer, and
- To develop a consciousness with respect to what roles they want to take when cooperating with organizations and companies.

The course has the following deliveries:

1. Reviews where project status is presented
2. One final delivery of the design project and a presentation of it
3. One final delivery of the analysis task.

We focused on the interrelatedness of users' and designers' interpretations of products by making the user more "real". The student groups were supposed to employ among others user personas and narratives for the design- and the communication process with the companies and assess to a certain degree how these tools work in these processes.

The hermeneutic task consisted of writing a report which described among others how (and if) these methods contributed to better understand their own motivation and values and how (and if) they influenced the (student-) designers' presentations and choices.

The final delivery of the analysis task included a project description and a discussion of the company's awareness of D&I and the cooperation with them. The analysis shall also include a short discussion of how user perspectives are involved and what kind of innovation has been related to. Finally it shall reflect on the student's contribution. The students shall respond to the following questions:

- A. *What kind (if any) is your innovation?*
- B. *What kind of "channels of user communication" (if any) are you utilizing?*
- C. *Are the kinds of "tools" and information presented in the course appropriate for the kind of products you are developing?*
- D. *Have you utilized any (or can you think of more appropriate tools) in your project?*
- E. *How "deeply" are you (if you are) utilizing (involving, perceiving) the user, or how deep do you think it would be appropriate to utilize them?*

3.3 Formalities and participants

The course started January 14. 2008 and ended May 29. The students, companies and teachers worked together for 18 weeks. The numbers of hours spend on each project at the companies varied from 6-8 to 15-20.

Student	Project name	Company	Company description	Contact person
Rudi Oskar Wulff	Lamps for hotel rooms	Northern Lighting	www.northernlighting.no	
Anders Kjelsrud Christensen	Installation for processing of waste water on ships	Scanship	www.scanship.no Maritime industry leader in advanced technologies for processing and purifying wastewater, food waste, solid waste and bio sludge.	
Jørn Reidar Christensen	Experience Design A research and design project for SKI-VM 2011	Snøhetta	http://www.snoarc.no/#/main/	Andreas Eggertsen Mikael Pedersen
Håkon Raanes	Snow blowing machine	Tokvam AS	http://www.tokvam.no	Finn Kristian Tokvam Tor Erling Tokvam
Vibeke Skar	Packing and Grafic Design	Frost Produkt AS	http://www.frostprodukt.com/main.html	Sondre Frost Urstad
Johan Christian Høgåsen-Hallesby	Webservice	Second Brain	www.secondbrain.com Web service developer	Johan Christian Høgåsen-Hallesby
Knut-Jørgen Velle Rishaug Bo Schønning Mortensen Christopher Svendsen	The Web of Tomorrow. New design for user interface	Opera Software	www.opera.com Browser developer	Jan Standal Director Product Management, Opera Software
Ingvild Støvring	A service concept	Norsk Filminstitutt	www.filmkivet.no	Kenneth Langaas
Marte Stine Richardsen	Quick Work – A service provider	Molift Group AS	www.molift.com Safe lifting and transfer of patients	Inger Lise Larsen Marketing Manager Tor Krog, Group Project Manager Innovation and New Product Development
Jegor Vasiliev	Electronic present card machine	mSale AS	www.msale.com	Stig Ø. Kvarsnes
Jegor Vasiliev Greger Lund Armando Fayloga Stubergh Rudi Oskar Wulff	Radio and MP3-player for elderly people	Dedicated Sound		Rune Andersen
Carolina Aquirre Lavendos Greger Lund Armando Fayloga Stubergh Ulf Sollid	Office lamp	Luxo ASA	www.luxo.com	Martin Holmberg Product Group Manager Luxo ASA

3.4 Results

The following pages present three student projects:

A) Mitt Arkiv ® - A concept to organize the film archive at The Norwegian Film institute and make it available for the general public, by Ingvild Støvring.

B) LINEAR - A free mobile lighting for interior working space, by Carolina Aquirre.

C) QuickWork - A software concept for moving and handling information in Healthcare organizations which uses patient-lifters, by Marte Stine Richardsen.

We have chosen these projects because they represent not only good design solutions but reflect in a comprehensive way about the product development process by integrating and acknowledging the users' perspectives.

3.4.1 Mitt Arkiv, project-case

Mitt Arkiv ® - A concept to organize the film archive at The Norwegian Film institute and make it available for the general public, by Ingvild Støvring

From Ingvilds report we would like to present the following:

“Mitt Arkiv ® main purpose is to organize the film archive at The Norwegian Film institute and make it available for the general public. One of the main target groups of the service is teachers at elementary-, primary-, high school and college. Mitt Arkiv ® includes several touch point (¹), both physical and virtual. The service is to be widely accessible and used as a source of inspiration and learning.

The service proposal will be collaboration between The Norwegian Film institute (NFI), Norgescfilm, Schoolbook publishers (e.g. Gyldendal and Cappelen) and The Norwegian Directorate for Education and Training.

The service is the provider and a facilitator: Mitt Arkiv ® works as a “collective” and the content and service is user driven. Mitt Arkiv ® offers the Norwegian Directorate for Education and Training (²) and its teachers an opportunity to specify the content of the service. The service is constantly changed and approved by its users. It is an application to choose from one of multiple implementations in the application configuration, for example, to provide access to different data stores to retrieve login information, or to use as a plug in medias such as itslearning.no or youtube.com. The service contains film, relevant content (background material, historical perspectives, persona and so on), tutorial planning, books and much more.

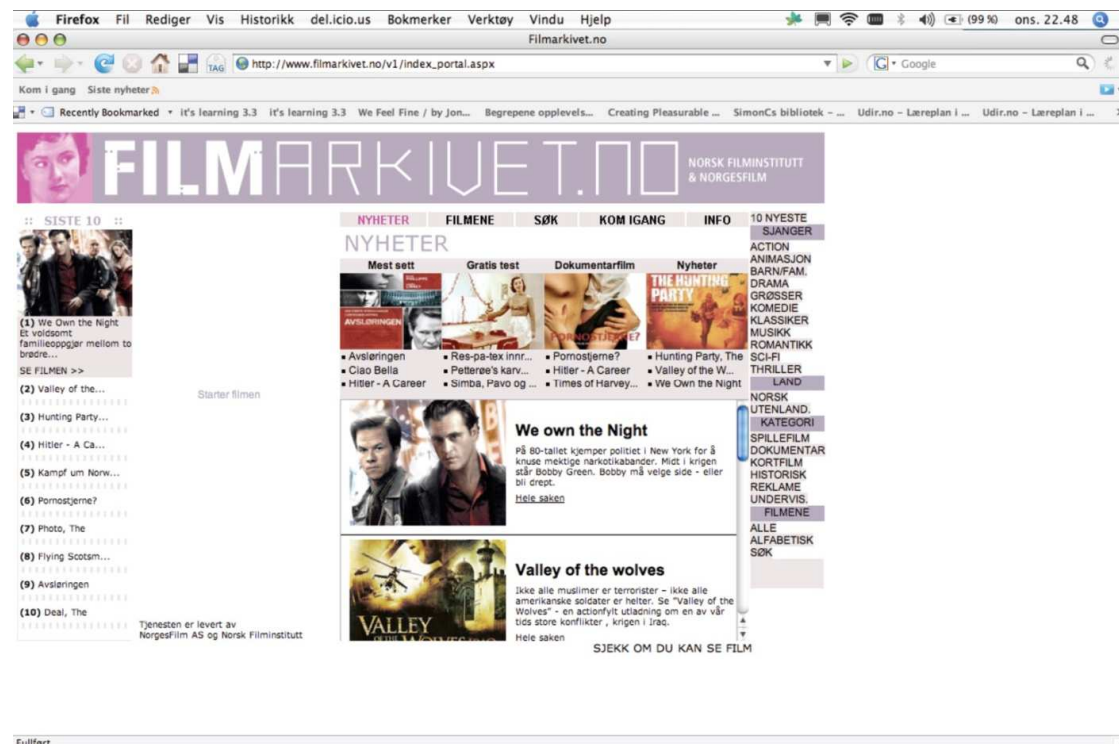
¹ Touch points are all of the physical, communication and human interactions audiences experience over their relationship with an organization.
<http://en.wikipedia.org/wiki/Touchpoint>

² The Directorate is the executive agency for the Ministry of Education and Research. The objective of the Directorate is to ensure that all pupils and apprentices receive the high quality education they are entitled to.
http://www.utdanningsdirektoratet.no/templates/udir/TM_Artikkel.aspx?id=346

The focus of Mitt Arkiv[®] is the web page. The site contains a huge database of movies, short movies, documentaries, commercials, educational films and more. This site will be folksonomic⁽³⁾, which means that the users will be creating tags, and generating parts of the content: E.g. recommendations play lists and editing.

This approach has been used because I believe it will help teachers feel ownership to the site, and contribute to them bringing their competence and expertise into the system.

Mitt Arkiv[®] also provides the users with books, tutoring-planning's, films and more. It is sent to teachers by mail. The package is not just a way of making the user familiar with the service, but is also an attempt to support existing routines in the user's working-environment. The "Mitt Arkiv[®] kit" will give the teachers the opportunity to build up a library that is both physical and virtual. In this way the service adjusts to the user's preferences and skills. Literary people often search for knowledge in multiple medias; both physical objects such as books, and of course, the web. This especially applies the elderly teachers.



Existing webpage

The process of studying users' perspectives and applying it

³ Folksonomic tagging is intended to make a body of information increasingly easy to search, discover, and navigate over time. A well-developed folksonomy is ideally accessible as a shared vocabulary that is both originated by, and familiar to, its primary users.

<http://en.wikipedia.org/wiki/Folksonomy>

The existing Filmarkivet.no is a service with no definition of a target audience. The existing site aims to communicate to everybody, and as we know, this is not a good way of reaching people. No one feels ownership to the site, and people have the impression it has nothing to do with them. People in the organization manage the content, and it is of “local flavor”.

The content is made by the organization for the organization. The content was badly integrated in the publishing system and difficult for users to search, comment and improve.

To avoid this in the new service proposal, and to get an understanding of the service and what needed to be done, we had several workshops at the Film Institute.

Employees from different parts of the institute was participating: Audience responsible, software developers, graphic designers, head of development, commercial responsible, content responsible and people working in the shop at *Filmens Hus* (a cinema run by The Norwegian Film institute).

A challenge was to get a common understanding of what needed to be done, and what the main focus should be in the new service. During my three different meetings with the people at the institute it became relatively obvious that the departments of the institute had totally different target groups and totally different strategies of communication. The end product had a lack of definition and how it should be developed. It was in bad need of a user-friendly environment and a user focus. A target audience needed to be established.

To get an overview and mapping out interesting directions to go, we used the AT-ONE method (see enclosure). The first day we worked through all letters with a goal to uncover the relevant issues. The following three weeks we used AT-ONE more thorough and formalized. By doing this, we managed to reveal several areas of opportunities. (See the workshop summary)

Together we decided that I should continue working with schools & teachers. The main reasons why we ended up with teachers as the target audience, was the content in Filmarkivet.no. It is most suitable and relevant for the target group. The chosen group is also a large amount of people with a common need. This specific group can be reached to government run “channels” such as The Norwegian Directorate for Education and Training. This is a huge advantage: To be able to communicate to such a large amount of people in one “channel” and be of absolute certain it will be evaluated.



Workshop with users

It was now important to figure out what kind of information that could bring the project forward. Thoroughly review of the AT-ONE workshops made it possible to get a better understanding of the users) of the service.

I arranged a workshop with teachers and students, to achieve user insights. The theme was; getting to know the user and their needs. I learned a lot about how to run workshops, and the advantage/ importance of having a designer as a facilitator.

To get a deeper understanding it is great to be able to visualize what the participants are discussing. The visualizations helped the participants to verbalize their ideas.

It has also been really valuable to be able to work with people with a lot of competence within different areas. By listening to their advice I could get a better insight. During the whole project I have had great resources available for guidance, help and input. This has been very valuable.

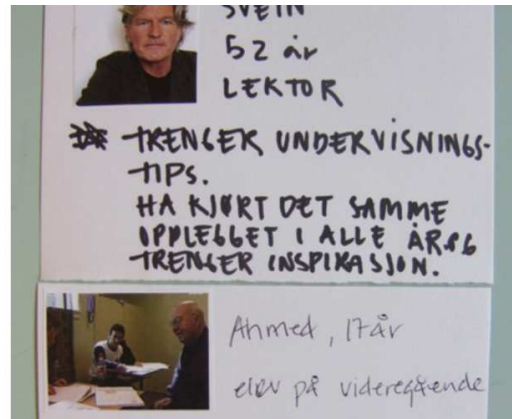
Innovation

From the companies point of view I believe the main innovation is that the new concept propose that the existing service should be available as a plug in for existing software, instead of trying to compete with them.

The existing Filmarkivet.no is drowning in all the other services that are available, and the competition is hard. Therefore I think NFI should realize and face what they really are: A company that delivers a limited amount of films whit a high quality that is difficult to find anywhere else.

By doing this they distinguish themselves from all the other products out there, and are competing on the right criteria. - Basically doing what they are good at, and not trying to be something else...!

Since we have had a user centered approach throughout the whole project I believe the new service will have a USP ⁽⁴⁾ (Unique Selling Point).



User-driven innovation lab

Design contribution

NFI is a company that is used to be working with designers, but they focus quite a lot on isolated touch-points with graphic design or interaction design, instead of seeing the service as a whole. “Embrace the complexity of services and think more about how an experience would flow across channels rather than how we could create one perfect interface.” Bottom-line experiences: Measuring the value of Design in Service

I contributed as a service designer and helped them to see the service from a user’s point of view. Since service design is quite a new term and profession, some of the methods (E.g. AT-ONE) I used were new for most of the people working at the Norwegian film institute. By involving them in the workshop they got to discover the real potential of their service. The main challenge for me as a designer was to be a facilitator for this, but also to make a decision on what to continue working on and getting the essence of the workshop-materials and discussions.

As I mentioned, the company and I started the process with workshops within the institute. This phase was very important for the company, so that they could get a common understanding of the today’s situation, and in what direction we should be going. By involving people from the company early in the process, you are able to offer ownership to the new service idea.

⁴ The Unique Selling Proposition (also Unique Selling Point) is a marketing concept that was first proposed as a theory to explain a pattern among successful advertising campaigns of the early 1940s. It states that such campaigns made unique propositions to the customer and that this convinced them to switch brands. The term was invented by Rosser Reeves of Ted Bates & Company. Today the term is used in other fields or just casually to refer to any aspect of an object that differentiates it from similar objects. Today, a number of businesses and corporations currently use USPs as a basis for their marketing campaigns. http://en.wikipedia.org/wiki/Unique_selling_point “Deliver value to people - not deliver people to systems”. In the Bubble by John Thackara.

Method

Research: I wish to uncover the user's desires, needs and problems, and learn about different contextual aspects.

Creating and using personas: The new service can be developed to reach a broad spectra of people, or one can segment into several vertical services to reach specific user-groups. e.g. children, students or people from 50-70.

AT-ONE: Looking at Actors, Touch-points, Offerings, Needs and Experience.

- Use and refine the material from the points above and define a design brief.
- Contact users from the research period and observe how they respond to the different concepts.
- Create evidencing

Expectations

"We hope that the service design project can develop new innovative solutions which could be implemented in the existing solution or result in a redefinition of the end product". Norsk Filminstitutt.

Process

This project has been explorative. The Norwegian Film Institute gave me the freedom to work with what I personally found exiting and where I saw potential. Once a week I was given feedback on the direction the project was going.

Most of the discussion was between me and the head of development, but often there were more people present. Because of this I got to see the project from different points of view: The audience responsible saw things one-way and the head of development another. This was fruitful and I believe it helped me doing a more interesting project.

Throughout the whole work the results of the research led the way. This was important if we really wanted an end-result that was more user oriented. The main challenge was to avoid making decisions just based upon interpretation.

In the concept development phase I made two quite different concepts; one that was trying to go as close as possible on the users needs, and trying to satisfy these. The other was more experimental. By working on the two directions parallel I got to explore different approaches, something I believe is important to do while you are studying.

The explorative concept had an idea of the interaction between architecture (the city) and people. The archive was presented on portable devices controlled by the users, such as a mobile phone. The user interacted with tagged clues placed by the Institute. The buildings and/or its environment were closely connected to the content of the film.

Now that I've finished I can see that I should have been doing this "exploring" even more, and not taking so many "safe" decisions. After finishing the project one could

debate the actual element of exploration. It is difficult, because you are working with a company and you want to make something that satisfy them and that they can use. So when I think of it, I am glad I had the opportunity to make the two different concept directions, because I believe they were good for each other.

In the completing phase I presented the two concepts for the company, and we did another workshop to see how we could push the two different ideas forward. We tested out the six thinking hats method (*) and together we generated new ideas.

At the end of this session we decided to continue with just one concept. This way it would be possible to have a more specific concept and get more into details. We ended up with Mitt Arkiv®, that they believed had a bigger commercial potential and is more realistic in terms of being realized.

* = The six thinking hats method:

White : Information/Available & Needed.

Red: Intuition and Feelings.

Yellow: Benefits and feasibility.

Green: Alternatives and creative ideas.

Blue: Managing the thinking process.

Red: Intuition and Feelings.

Black: Caution, Difficulties and problems.

It was of great advantage to work with the people that are making the decisions. Often when you work on a concept for a long period of time, it is difficult to look at it objectively. I was not sure which one was the strongest, and would probably continue on working with both of them.

Conclusion

There is a balancing between trying to make a service that pleases the company and making something that challenge yourself. In the process of learning one should think radical. Failure is one great way of learning. As a student it is important to keep in mind what you want to learn and what you are eager to explore.

For a four-month project, I think I spent a little too much time on methods and research. I wanted to get a deep understanding of the user and the context of use. This leaves less time for specifying the product. But then again, the process of learning is by using the different methods, learning research and getting an understanding of the users, not the fine-tuning of an end result. The project made me understand the core of service design and its key elements.

I think it has been great to work with people at The Norwegian Film institute, and I believe designers should be doing this more: Involve companies in the process making a designed service more than “a product” but also an innovation. Design should be a method for innovation making a more precise definition of a designer’s role in society and hopefully giving a greater understanding of the need of good design. Another thing I found interesting was the difference between mine and the companies’ motivation for the chosen user-group. The company asked if their content had any economical value, and if so, where?

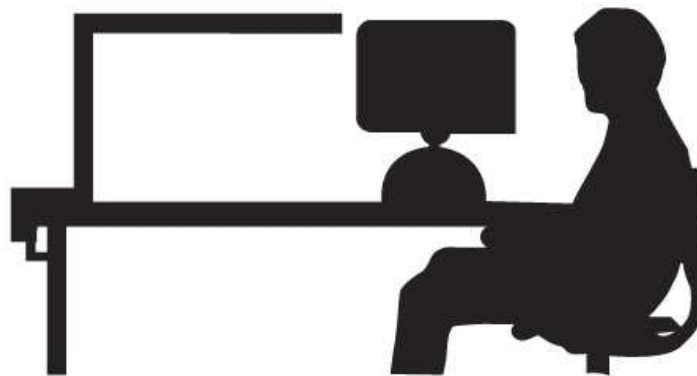
I asked myself for which user will the content be most valuable? We both ended up with the same answer. “

3.4.2 LINEAR, Project-case

LINEAR - A free mobile lighting for interior working space,
by Carolina Aquirre.

The following text is from Carolinas report:

“ Luxo (lighting company) delivered us the task of creating a free mobile lighting for interior working spaces, office landscapes and working stations, that would suit for the criteria's of flexibility, mobility, functionality and possibility to regulate the light to a own working situation.



The result is LINEAR, a highly flexible lighting solution for today's ever changing office environments. A free mobile lighting for interior working space that can be moved easily into any direction that it is wanted. A lamp that meets the costumers needs for efficiency and comfortable working environment, by offering the best ergonomic lighting solution, combining design, light technology and simplicity.

It was taken into account the importance of creating a product based upon costumers needs and understanding the nature of both consumers interaction (the consumer and the actual user), which in this case where two different personas.

It was also important to embrace the design process being aware of integrating these 3 main variables: The Users needs, the technological opportunities and the products language (how is delivered the message to the user) for the development of an innovative project.

User

Luxo's main user is totally different from the main consumer of their products. Their main consumer is basically architects, interior architects and Furniture distributors. (Main costumer: office markets: schools, Kinnarps), which are the ones that select and buy eventually the lamps for different office landscapes and working situations. But the real user is basically secretaries and school/ university people, which are the ones that in the end make use of the product itself.

Therefore it was very important to understand the nature of both consumers interaction, since one is the one that buys the lamp, but the other is the one that eventually uses the lamp.

Having this problematic of different consumer /user, of dealing with different personas, meant having to deal with different profiles, roles and flavorings. Therefore, what it had to be done was to look what was the thing in between the interior architect and the secretary that in the long run they had in common.

Therefore the task was to approach these two personas, see what triggered the interior architect to buy a certain lamp, and what triggered the secretary to use it, and how it is used.

I think it was important to understand how this dynamic works and how this users interact and affect the development of a product, in the sense of understanding how and why they act and how they experience with things and how they think.

Even though a workshop was done, where different architects and interior architects were invited, to help us understand what were their needs when creating or thinking of the development of a highly flexible lighting.

The thing that told us more about the consumer was not only what they told us, but also analyzing their environments of work, what told us efficiently their needs in a working environment.

This was especially necessary when analyzing the main user, a secretary, or even ourselves. Looking at our own worktables, we could see what where our needs in relation with light, and get into depth the products emotional and symbolic value, rather than the form and functionality. How light is perceived in a working environment, what it means, and a "system of values, a personality and identity that goes beyond style."

In what matters to furniture distributors, the approach was more into the direction of style, and what is now new going on.



I approach different fairs, and specially one of Luxo's main furniture distributors: Kinnarps, to find out what language could our product adopt or develop since especially in furniture and lighting industries, functionalism and styling's (aesthetics) matter is considered to be the input driver of competition.

Therefore, in the development of the project, it was more of a combination of user driven project, in the sense of using their "user knowledge" to create a product that satisfies their needs, but at the same time concentrate on the problem definition, of creating this flexible lighting for interior working spaces, to therefore come up with new solutions that could have successful results. (Design inspired Innovation)."

3.4.3 QuickWork – project-case

QuickWork – A software concept for moving and handling information in healthcare organizations witch uses patient-lifters, by Marte Stine Richardsen.

Marthe writes:

"From product- to service provider

My delivery is divided into to parts. The first "delivery" is a new perspective of what the company delivers. I see the company as a service-provider instead of a product-provider. The new perspective is introduced for the company through a service-design process and the description of the company as a service-provider is collected as "Service maps".



The second part is a service concept as an example of what a service design process can lead to for the company. This concept is called QuickWork and it is software for moving and handling information in healthcare organizations witch uses patient-lifters. The software is for smart phones, pc and Molifts patient lifters. In the future careers may carry smartphones with electronic patient journal.

QuickGuide makes it possible for the career to get updated information about the moving and handling situation for the patient on these phones. Information they get is about where the lifters is and its condition, QuickGuides for use of the lifters and possibilities to send messages about the lifter and the moving and handling situations to the caretaker and physiotherapist. The software is also for the lifter to automatically adjust to the actual patient.

The information is easy accessible for the career by RFID technology. Every person and lifters have their RFID tag with a code. The career has a tag in her watch, the patient a tag outside his door and the lifter has also a tag. When the smartphone is in reach of the tag the actual information is displayed. The lifter also read the tags to adjust. But it is also possible to search for the information on the phone manually.

QuickWork gives the opportunities to connect to the QuickBase where the career can download personal settings and information, such as QuickGuids in their own language and with the possibility to choose to get the phone to “speak” to the patient while lifting him. The QuickBase also have motivation programs for the career, like a competition to lift the most with the lifter in a period.

User involvement

The core problem for Molift has been that the careers have, but do not use the patient lifters. My challenge was to design something that made them use the necessary equipment. And often the reason why people do not use products is because its not designed for them (Cooper, 1999). Then it is obvious that the user needed to be brought into my design process.



User involvement

In the beginning of this course we where introduced to the design and communication-tool Personas. The idea about Personas, invented by Allan Cooper, is to describe a constructed user to represent the user in the design-process. (Cooper, 1999) With persona it should be easier to communicate the users need and make decisions in the design process. Cooper says that persona have to be constructed not real people because they have “funny quirks and behavior ideas the quotation. This gave me many different ideas, based on each need. During the whole project have I also discussed ideas with different users.



Maria Johannesen
sykepleier

"Jeg er så glad i det nye systemet. Det er ikke bare det at arbeidet går raskere, men det er gøy også.

Føler endelig det er noe utvikling for oss sykepleiere. Det er jo vanligvis legene som får nye spennende ting. Men nå har til og med pleieassistentene PDA i lommen i stede for penner.

Men det beste er kanskje det at vi har all informasjon på en plass og kan hente det frem akkurat når vi trenger det. Før løp vi bena av oss for å finne heis og få med og gi beskjeder."

User experience

This has given me the right perspective and help to sort out what is good and what is bad, and connect my ideas to real life for the user.

Innovation

The innovation in this project is for the first a business model innovation. The new perspective on the company as a service provider instead of a product provider has resulted in new methods for developing the user experience.





The new concept

This innovation is at the beginning innovation for the inside of the organization, and may later result in innovation for the user. The QuickWork concept is service innovation. It is a system to improve the existing service experience. The system could make the careers use the existing products or services more and the result will be fewer sick leaves among health care workers and then less cost for the society.

3.5 Experiences from the Ludinno learning lab and future perspectives

Ludinno Learning Lab at AHO had not the goal to create general instructions for industrial design but was seen as a possibility to motivate design students and the involved companies playfully to “think outside the box”.

The intention was to show the interdependency of user and producers by making the user more real. To this end, we introduced the personas contributing to a view of the users’ understanding of problems and enlarging the design process through the consideration of user goals.

Although the persona creating process was interesting for the participants and derived concepts were good, the deriving solutions from persona drawing, observations, narratives and interviews could not be developed sufficiently (mainly due to time and cost reasons) and the outcome is thus rather intuitive instead of analytic.

In our opinion comprehensive, educational courses and increased research on knowledge and skills required for user-driven innovation could meet this problem. Especially for AHO, since we continued with the persona approach in 2009 within the design course: V08IDES1 Design som tjenesteyting, Personas: utvikling og bruk i produktutvikling.

Attached to an improvement of the curriculum is a requirement for interdisciplinary cooperation in design research, education and practice. This was among others also the feedback we got from the presentation of the Ludinno project at two conferences: 7th NORDCODE Seminar & Workshop, Lund University, Sweden and 6th Conference

on Design & Emotion 2008, School of Design, The Hong Kong Polytechnic University, 6-9 October 2008 (see reference below).

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4 Learning Lab/Do Tank Helsinki

Written by Ilpo Koskinen

This chapter is partly based on IP08 (Ilpo Koskinen, Jussi Mikkonen, Petra Ahde, Kaj Eckoldt, Thorsteinn Helgason, Riikka Hänninen, Jing Jiang, Timo Niskanen, and Benjamin Schultz) 2009. Hacking a Car: Re-Embodying the Design Classroom. Proceedings of *Nordic Design Research Conference Nordes 2009*, Aug 30-Sept 1, Oslo. Available at www.nordes.org.

4.1 Background

One of the design education challenges at the University of Art and Design Helsinki has been interaction. The School of Design runs an extensive educational program that integrates most elements outlined in this report as challenges for university education. This paper explains how we used the Do Tank Helsinki to develop our program further.

Out of design disciplines, industrial design in particular works extensively with industries. Industries also fund a good deal of industrial design education. At master's level, education is run in English for a multicultural student body.

Most projects are multidisciplinary. A good deal of education takes place in the School's eight studios. One quarter of the School's personnel are workshop masters rather than administrators, lecturers, or professors.

In addition to all that, mostly due to inputs from industrial design, the School has built a successful research program that constantly produces internationally recognized publications.

The challenge in the School is that the world and industries change, but education follows slowly. Although the industrial base of Finland has changed dramatically over the last 30 years, education still serves the industrial structure of the 1960s. For example, the School runs extensive programs in ceramics, glass, and textiles, even though these industries barely exist today.

Even in the most dynamic design discipline, industrial design, changes have been far and few after mid-1990s, when professor Juhani Salovaara created a program called International Design Business Management together with professors Jukka Ranta and Reijo Luostarinen from Helsinki University of Technology and Helsinki School of Economics. In recent Business Week ranking, this program got into top 10 design programs of the world.

4.2 The Challenge of Interaction design

Since the mid-1990s, however, Finland's traditional industrial structure has gone through a major restructuring. While paper and pulp industry is in the path of becoming marginal, electronics and ICT has become a cluster, first centered around Nokia, but now with influence in practically all industries of the country.

In many niche markets like adaptors, Finnish companies are world leaders. They are also significant players in many other technologies that pose interaction challenges, including lifts and, naturally, mobile phones.

Graduates who have focuses on what is known as interaction design have found jobs places from working on what has come to be known as "interaction design," creating concepts and improvements to interactive devices, studying how people interact with increasingly complex technologies.

The School has responded to this change through many ways, most importantly through research, which has concentrated on usability, which later turned into studies of user experience, and later into user-centered design.

Industrial design program has divided into three main specializations, traditional product design, design management, and interaction design. Several master's theses come out from interaction design annually, and the School runs several research projects on this area on a constant basis.

Do Tank Helsinki is a part of this response. It was a class called Interactive Prototyping, in which industrial design students had to learn not just to envision new technologies, but also specify them from a technical standpoint, and build a functioning prototype. Do Tank Helsinki had three aims:

- Learning aims: improving students' individual skills and reflective capabilities
- Organizational aims: probing a suitable way to teach electronics and embedded systems
- Scientific aims: merging research process and design process and merging these into a 9-week program

4.3 Do Tank Helsinki: IP08

Interactive Prototyping (IP08) is a 9-week design class given at the University of Art and Design Helsinki. In this class, MA level industrial design students go through user-centered design process over nine weeks. Students have to create a design concept, learn the basics of microcontroller (ATmega8535), elementary programming in C, and refresh the basics of electric circuits.

In Spring 2008, the design problem of the class was co-experience in the car and safety while driving. Interaction between the front and the back seat is a major road safety issue, taking people's focus away from what is happening on the road, causing

potential hazards and introducing risks to driving (Battarbee 2004; Summala, Karola and Radun 2003).

4.4 Preliminaries

The design brief for the class reads as:

This class creates concepts for improving experience in the car in situations in which there are several people in the car doing ordinary things together. These ordinary things are things like organizing entertainment for children, sharing and eating food, calming down children who fight, and so forth. These are organized activities that can be studied and described for design. Specifically, the focus is on what happens between the front and the back seats between children and grown-ups/more mature teens in the front seat. Importantly, ordinary activities like eating make traveling in cars more pleasant. However, they simultaneously take people's focus away from what is happening on the road, causing potential hazards and introducing risks to the driving experience. What kinds of things take attention away from the road? Which ones are potentially dangerous? How could one make driving safer with design?

IP 08 tried to teach prototyping, the most important philosophies of prototyping, the basics of microcontroller and programming, and studying prototypes in field conditions. The reflective aim was to learn to cooperate with electronic engineers. Organizationally the class prepared setting up an electronics studio to the university to facilitate interaction design.

In Spring 2008, the class had seven students, three Finns, two Germans, one Chinese, and one Icelandic. Three were women, four men. Although the class was informed by research practices in leading design universities (see Koskinen, Binder and Redström 2008), what was new in it was its continuous effort to connect the body into designing embedded technology.

4.5 Studio

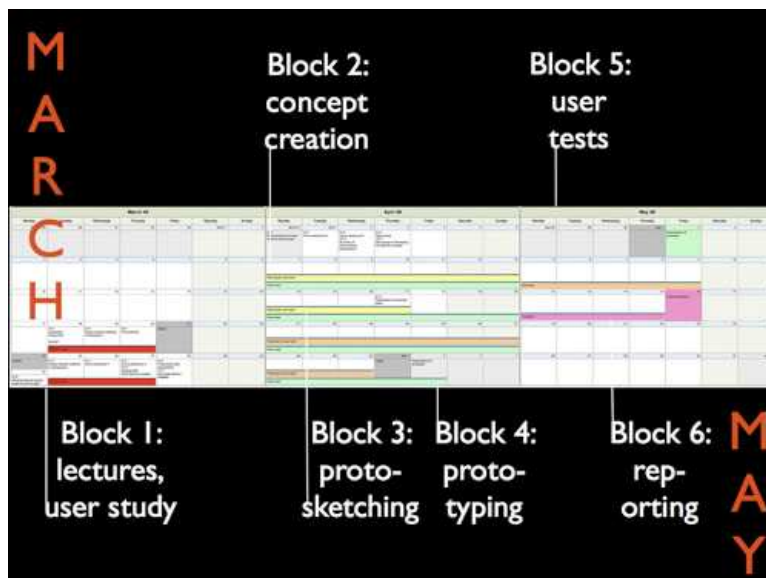
We bought an old 1989 BMW for the class. The car was in register, and in full driving condition, but old enough to be rebuilt in the studio devoted for the class. Being located in studio context of a design university meant that students working on the car had an easy access to variously shaped and sized fellow students for user tests whenever they wanted.



Following the philosophy of the class, we wanted to give students a first-hand bodily understanding of embedded technology, in our case how sensors and actuators work. To get an idea of how one can integrate sensors and actuators into consumer-level products, we borrowed two Wii games from Nintendo, and started the class by playing and studying Wii's accelerometer.

4.6 Actions

The picture below describes the structure of the class. It started with a knowledge packet and user study in March, continued through a concept design phase through protosketching to prototyping in April, and ended with a user study and reporting phase in May.



In detail, the phases of the class were these:

- *Block 1:* Knowledge component: lectures on design research processes, electronics, and the physics of sensor systems. Also, a short user study had to be conducted to get an anchor for discussions to come.

- *Block 2:* In concept creation, students went through user data and processed it into first three concepts, and then narrowed down to one concept per group. (Students worked in three groups)
- *Block 3:* Students had to find ways to sketch interaction with toys, appliances, video cameras, Lego Mindstorms, and so forth. The aim was to test variations of design concepts, and rule out troubled propositions.
- *Block 4:* Students build prototypes with the assistance of an electric engineer.
- *Block 5:* Students had to test their ideas with users to see what kind of feedback they got.
- *Block 6:* The final stage was reporting the results.



Pictures: (1) Early stages of the class: from user studies to concepts. (2) Studying ideas with interactive sketches. (3) Prototyping. (4) Computer rendering of the final prototype of BugBugs, a game concept in which the steering wheel was used as a sensor that directed the “bugs” with which the game was played.

In terms of outcomes, the prototypes were finished, and students wrote research reports of their process. In addition, several papers have been published in scientific and student conferences in Europe. Even though this was a high-risk class and company involvement was kept at a minimum, the class expanded the School of Design's company network. At least one concept was being studied for patenting purposes.

4.7 What Next

As such, Do Tank Helsinki was a typical technically oriented design class. In fact, the main difference between this class and similar other classes was the strong research foundation of the class.

However, it had several specific aims, many of which were achieved. *Students* learned elementary C language, the basis of microcontroller, sensors, and actuators, as well as a research-based design process. After the class, they were able to think about themselves as researchers, not only as designers, while still basing their craft on design. *Organizationally*, the School of Design established an electronics studio in 2009, which has become a cornerstone in establishing an interaction design specialization program at the School of Design.

Scientifically, the foundation for the class was laid in 2007 in Interactive Prototyping 07. For that class, Koskinen analyzed prevailing design research methodologies and classified them into three main types (see Koskinen et al. 2008). This model was turned into a research-oriented design process in IP08 and later in IP09, and Koskinen is currently working on a book on this topic with funding from the Academy of Finland.

Finally, the class is leading to a philosophical redefinition of design education in several universities in Europe. Its themes were explored first in a paper (IP08: 2009), and later in a workshop on non-Cartesian foundations of design in France. The central idea is to place doing, not analytic perspective into the very center of interaction design, which so far has been dominated by analytic representations and logical models.

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5 Learning-Lab/ Do Tank Aalborg

5.1 Ludinno report: background

5.1.1 *Communication and representation techniques – why they are critical.*

Designers are very acquainted with the set of communication techniques used in the typical product design context. Such techniques are used in the different phases, from analysis to development and synthesis. Such tools have been further developed in more recent user-centered-design studies (Brandt, 2004; Buur & Soendergaard, 2000), in order to involve users in the product development process.

Depending on the subject under development, the final-user could be observed and video-documented for analytical purposes, or the user and designer communicate and test aspects of use and understanding of the product through mock-up models.

Within the existing paradigm, based on product design, the designer has a well-established knowledge on *what* to communicate to *whom*, and *when* in the design process is appropriate.

The designer can communicate to the engineer or workers from the production line using technical representations ranging from principal drawings to blueprints that also demonstrates the designer's knowledge on the construction and manufacturing and thus establishes a communication. The designer can communicate to final users, using renderings, photo's mock-up models and scenario descriptions and visualizations.

A user-driven approach though, would suggest that new actors be involved besides the traditional technical actors – producers or managers. The new actors are co-producers of the solutions; they are service providers, organizations, institutions and final users. Those actors, once passive receivers of the outcome of the manufacturing process, are now included in an extended production system (Morelli, 2008); therefore their action needs to be appropriately addressed with adequate forms of communication (Morelli & Tollestrup, 2006).

Furthermore the nature of solutions based on this approach is much more complex, as immaterial components, such as uncoded and coded knowledge, organizations and services are often more relevant than the material components (products).

Designers have good communication tools to manage the material part of their solution, but they are not necessarily able to represent the immaterial qualities (i.e. interaction, events, and sequences of actions) which must be effectively communicated in various ways, depending on the recipient.

The designer needs new representation techniques in order to address her/his communication to the right recipient and understand what information is critical and useful for the specific recipient.

On the basis of such considerations the Ludinno learning lab in Aalborg focused on videos as an advanced communication tool designers can use when working on users and with users in the development of new solutions.

5.2 The Ludinno learning lab in Aalborg

5.2.1 *Introduction and general information about the workshop*

The framework for the LUDINNO workshop

This paper will report the outcome of the LUDINNO workshop at Aalborg University, Denmark, in September 2008. The contribution of this project to the general LUDINNO framework consisted in the development of user-centered methods based on the use of video, both in the analysis (video-observation), in the design phase (Video-sketching) and in the communication phases.

Video has proved valuable to design work due to its ability to record and offer registration of ‘what happens’ during fieldwork.

Video as a medium for sketching has also been tested and has shown certain abilities in illustrating ideas in a use and time perspective and finally video has a well-known communicative strength.

In the A framework for the workshop was therefore designed to facilitate these different uses of video. The workshop ran for three and a half weeks - starting on a Wednesday (3. September) and ending on a Friday (26. September). The workshop went through four phases, Research, Analysis, Synthesis and Realization, divided on the three and a half week.

The first phase was ‘**Research**’; here students went to pre-arranged field sites of relevance to their project. All field studies were conducted as ‘situated interviews’ and participant observation. These were carried out by a minor group of students allowing them to divide roles between them, while some of the students managed the communication with the users others would video record the interview and what the users did. Because of the prearrangement of field studies, most groups concluded them and were ready for the following phase at the beginning of the second week.

The second phase concerned the ‘**Analysis**’. In this phase the students were challenged to think of the material from their field studies as design material rather than hard data. By the end of this phase the students were required to facilitate a workshop for their industrial partner, who originally proposed the assignment to them.

The workshop was based on the “Video Card Game”. This method was used to facilitate collaboration between students and stakeholders from the involved companies. In the days up to the workshop, the students had to learn how to edit their ethnographic video material into video snippets (Johansson & Linde, 2005) and prepare the facilitation of the workshop.

The workshop was useful to confirm existing scholar findings and work out new understanding on how to use video material. Through the workshop the students in collaboration with the companies created a shared platform of problem identification and possible directions for the project.

The shared understanding became the foundation for the following phase, **Synthesis**. Here the students were put into the more traditional *designer* role, however the students were required to continue their work using videos as the main medium for designing and communicating ideas. The students were introduced to ‘video sketching’.

The last of the four phases was **Realization**. Here the students detailed their concepts using the video as a communication medium.

The workshop was planned to run through the four phases described above. The four phases represent a rigid structure, as well as an old fashion way of perceiving the design process – the phases in this rigid structure were thought to be a tool to facilitate the progression for the students, since not all of the students were accustomed to designing. However, plenty of time was allowed for students to take on a more iterative process, when needed.

5.3 Outcome of the Aalborg Learning Lab

Some consideration emerges, at the end of this workshop, about the use of videos in a user-centered design activity.

5.3.1 Analysis

Video has been used for analyzing users in their own working/life environment. In a group working on the design of a food delivery service for elderly, for instance, the students visited different relevant contexts, including elderly in their private homes and in nursing homes, to understand the elder’s perception of the existing service as well as their abilities (to eat independently, or to prepare meals) and food culture.

Meanwhile other students visited the local industry kitchen, which prepare the food for the elderly in the community, to observe their way of working, routines. They interviewed the staff about their experiences.

Furthermore the students followed the workers who deliver the food to the elderly. In this sense the students were occupied with both the front and the backstage of the service to get a coherent perception of the services dimensions.

As the students entered the second week they also entered a second analytical phase of the project.

As previously mentioned the students had video recorded their observation during their field studies and were now faced with the challenge of analyzing and interpreting it in order to bring new user knowledge into the design process.

Video has proven valuable as a media for close and repeated observation, analysis and interpretation by preferable a number of participants due to its visual and audio al capacities (Botin, 2005).

Analyzing video has traditionally been carried out in the humanistic tradition studying social collaboration, language, children's development etc. These types of studies have called for in-depth work taking minor details into account through precise transcriptions. This approach to video analysis is very time consuming and thereby difficult to apply to design.

Yet, as stated earlier, studying video of users activities in their real context is highly beneficial input for design work, however it is important to bring this activity into design in a proper manner that suit designers way of working and the time constraints that designers often are faced with.

Video is a rich media for analysis, however it requires unfolding and interpretation. In the workshop the students were asked to create content logs of their recorded video. Some students had just few hours in which different actors had to illustrate their working routines or behaviors

A group who had the task to develop interactive games for ice hockey matches had to analyze people's behavior during the break of a match. Other students had more than ten hours of video material concerning the type and quality of social interaction of people watching television.

Each group had to find out a suitable level for content logging according to the quality and amount of the video material as well as its relevance to the given design task.

The students were asked to develop contents logs consisting of three columns for time, observational description and interpretation/relevance. When creating a content log, time is of great importance as a well created content log offers quick navigation in the video material in the following phases of the project.

The observational description is a *neutral* (i.e. without judgments of added meaning) description of what was observed. However the interpretation is bound to be subjective and based on the individual private opinion as a part of this the students were asked to indicate, how the observation and their interpretation of it can become relevant to different parts of the project.

The process of content logging gave the students an overview of their recorded material, new insights and some ideas to discuss with their industrial partners in the next meeting. The content log became a valuable tool as they progressed in the preparation of a workshop for industrial partners.

5.3.2 Interpretation

the video card game has been used to interpret the video analysis together with users/clients and to identify direction for the concept development phase.

Design is often understood as the creation of product, tangible as well as intangible, and being explicit about the capacities and potentials of the specific product. From this point observing and analyzing what is verbalized comes natural and seems reasonable.

This ‘verbalized’ notice has inspired much valuable research, for instance the work conducted by Jason More and Jacob Buur on engineers and designers handling of ethnographic video material (More & Buur, 2005).

More and Buur had an action research approach by participating in on going projects at the pharmaceutical company, Novo Nordisk (Ylirisku & Buur, 2007), which among other product categories produces diabetic equipment for injecting insulin. More conducted field studies and documented these by means of a video camera. The video material was brought into the company through workshops using the Video Card Game method.”(Buur, Binder, & Brandt, 2000).

“The basic idea of the Video Card Game is to turn video segments into artefacts (cards), which the developers can refer to and handle in a design discussion. With the cards the developers create new understandings of the design directly in the video media. To make this succeed the developers need to work sufficiently with the artefacts to appropriate them for their design practice.”(Buur et al., 2000)

The original Video Card Game consists of five interconnected phases; ‘Dealing the cards’, ‘Reading your cards’, ‘Arranging your hand’, ‘Collecting card families’ and ‘Discussing the card families’ (Buur et al. 2000, p. 64-65).

Through these phases the participants study and discuss a selection of video sequences in smaller groups as well as categorize the video cards in themes through which problems for solving and opportunities for exploring emerge.

On the lap top the participants observe video sequences, also referred to as “video snippets, fragments from the field. The fragments are gathered from video recordings made during the field studies. The snippets are not intended to give a complete picture of the practice, but glimpses of practices that seem to be important to the practitioners or are interesting for the design project as such.” (Johansson 2005, p. 44-45)

5.3.3 Concept development

Instead of pencil and paper, students have represented the concept by acting it. Here the process have been slowed down by the time spent in learning the video software and in planning the video, even for quick and dirty videos.

Services imply the direct participation of users in shaping the service. Unlike products, which totally defined in the production process, before the use comes in contact with them, a service is just partially defined in its basic component. A service really comes to existence once users and the service providers come in contact. For this reason the behavior of users in the service encounter is fundamental.

The active role of users in a service needs to be supported by an adequate communication of what the user is supposed to do, how is s/he supposed to use the service, what are the time sequences, the scenarios and the possible events happening during the service.

All those components need to be specified in a *service blueprint*. The need for a service blueprint was first emphasized by Linn Shostack (Shostack, 1982), who proposed a first approach to forms of rendering of a service, that make it possible to communicate service characteristics and components in physical documentation. After Shostack, other contributions have focused on service blueprint (Morelli, 2002; Ramaswamy, 1996). Some contributions (Morelli & Tollestrup, 2006) pointed out that the participation of common users to the development process of a service would require a totally different approach to representation technique.

Users are not supposed to have any technical knowledge before using a service; they are not supposed to be familiar with any technical language for representation techniques.

Furthermore the participation of users to the service co-production requires a strong emotional involvement, that could only be encouraged by using certain representation tools that are not presently used in design and engineering disciplines.

In the context of service co-production, alternative representation techniques such as video representations are not only a communication tool but also a design tool, which support action, collaboration, creativity and shared understanding of the service among different actors, particularly among the users.

In the Ludinno learning lab in Aalborg those forms of techniques have been explored from different perspectives; video have been used for:

- Concept development
- Testing hypotheses
- Proposing critical views about a concept
- Providing non verbal instructions
- Providing additional information that cannot be provided through other media or representation techniques.

5.4 Video sketching for concept development

Video Sketching is a very effective technique to support communication between designers and customers during the concept development process, rather than at the end. Here videos are used instead of paper and pencil sketches, to give customers and clients a clearer idea of the concept to develop. This technique may prove particularly useful in service design and in any cases in which users are involved in the co-production of value.

In the Ludinno learning lab in Aalborg students replaced video sketches to the traditional paper and pencil work. The students worked on video sketching soon after having defined a design brief in general terms with the video card game; they used very rough video techniques to generate video scenarios. By **acting** scenarios, instead

of drawing them on paper, the students could get a better understanding of time and space related issues in the solutions they were proposing.



An example of video sketching for the “Oceanarium” project.

The students drew a geographical map on the floor to simulate a real map on which the user could walk and choose special “hot spots” to get information about marine life, fishes, etc. Here the interaction between the user and the floor map is studied.

The intention of the learning lab coordinators was to have a higher level of participation of companies and users in the video sketching exercise. However this was not possible because of the short time given for this phase of the learning lab (one week) and the relative lack of familiarity of many students with video techniques or with representation techniques in general.

5.5 Video sketching for testing hypotheses

Besides being a very effective tool to represent future scenarios, video techniques are also a good tool to understand which present conditions should be considered, in order to understand how such conditions would work to support or to hinder the solution.

Videos were particularly useful when investigating conditions that were not familiar with the students/designers. Students, for examples, used videos to study how a blind person could use different senses to find his/her way in an unfamiliar environment.

Of course here videos were only used to record and discuss a test, whereas the highest relevance was in the exercise of acting the user, thus reporting any problem users could find in his/her own experience. Students and designers were also very aware that blind people find much more resources to find their way in unfamiliar environment by using their own tacit knowledge (sense of balance, sensitivity to

special noises), that is not equally developed in people used at getting information simply through their sight.



Using video for testing hypotheses.

Here a tester was blinded and asked to find his way through a raised path on the floor. The experiment aimed at verifying different ways of emphasizing emergency exits for visually impaired people.

5.6 Video sketching to propose critical views about a concept

Technological innovation is suggesting new and interesting scenarios influencing our lifestyles and the quality of social interaction. In many cases technological opportunities need to be verified against criteria of feasibility and/or desirability of the same solution from the social and cultural point of view. Video, in these cases, has been used to support the discussion on those themes.

A project on new ways of using television for social interaction suggested several hypotheses about the quality of such interaction in real situation. Several technical hypotheses were explored, concerning the use of the remote control, the use of new display modes, and the use of the television by different people in the same time. The videos were visualizing hypotheses and clarifying the issues arising from each technical suggestion.

The simulation of the interaction of different actors and in different social situations provides a critical support to the discussion on possible and desirable (or undesirable) design solutions.

How should we control it?**Example of using TV for social interaction.**

Different people can see different videos on the same TV set, however the problem is how to control the TV, how to avoid noise and interferences, and above all, what quality of social interaction can this technology allow.

5.7 Video sketching to provide non verbal instructions to users.

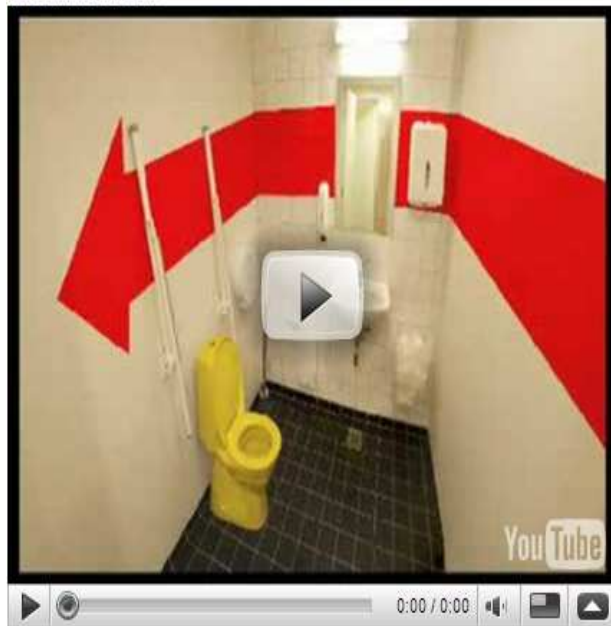
Visual communication is more direct and “natural” than many other forms of communication. This is particularly important in cases in which users and content/information providers do not talk the same language.

Of course signs and icons and symbols are used in this case to support communication. However the lack of a time context is often an obstacle to the correct and immediate understanding of the information users should get. In this case videos can be used to visualize sequences of events and therefore to provide time based instruction to users.

A cleaning company working with multicultural personnel worked with the students of the learning lab to explore new forms of communication that could support the learning process of the personnel.

The use of visual communication also allows for a rapid transmission of information. If such information is stored and periodically updated on a online repository it will be possible for users to access to any needed information in a very short and effective time.

How to provide visual cleaning instruction to cleaning personnel that may not be able to understand written instruction.



Example on how some cleaning instructions can be quickly and effectively provided to personnel that is not necessarily able to read or to understand written language. Here colours and symbols are overlapping the video, in order to emphasize a sequence of procedures.

5.8 Video sketching to provide information that cannot be provided by other communication media.

Several aspects in a design project, and in particular in projects in which time, experience and emotions are critical, cannot be easily communicated through the traditional media (drawings, graphics, and pictures). In those cases video provide additional information that contributes to make sense to a design hypothesis.

In services concerning health care and elderly care, for instance, the emotional and experiential components of the project are often prevailing over the functional requirements. A project that cannot emphasize those components would have no chance of success, regardless the functional efficiency of the solution.

In a project about new ways of providing food to elderly people, students and companies in the learning lab used videos to emphasize social and cultural aspects that are fundamental for giving elderly people a better quality of life a more intense social interaction or a sense of independency.

Videos provide emotions and feelings that cannot be communicated otherwise and increase the empathic relationship between the user and the solution proposed.



For elderly people, as well as for many of us, lunchtime is not just a time for feeding ourselves, it is also an opportunity for social interaction. Such opportunity though is lost for many elderly people living alone in their own home. This video explain the aspects of social interaction that would be enhanced by video-communication.

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6 Learning-lab/DoTank Linköping

Written by Johan Blomkvist, Stefan Holmlid

6.1 Introduction

The learning lab in Linköping had its primary focus on early innovation processes and user-involvement facilitated by designers. This was achieved through four slightly different learning lab processes and structures during spring and summer of 2008.

Multi-disciplinarily is at the heart of this learning lab, achieved through 1) involving product designers, interaction designers, industrial designers, cognitive science students, economy students, design students, disability studies, with companies, innovation promotion organizations and researchers in the learning lab; 2) varying the design object over several different design disciplines, such as graphic, product, interaction and service design.

The main actors directing the learning lab were:

6.1.1 Santa Anna IT Research Institute

Responsible for management of the learning lab, contracts for commissioned projects and the network of designers employed.

6.1.2 Linköpings universitet

Provided both academic training for participants and design studios in which designers were working. Research resources and researchers from the VINNOVA funded projects ICE and SERV contributed to the learning lab.

6.1.3 Treport Design

A design incubator funded by the City of Linköping participated as design coaches during the summer design office.

6.1.4 SVID

Provided the summer design office with design students.

6.2 The Linköping Learning Lab

Students of product design, design (cognitive science), and disability research were given different tasks. Also, a group of four design students of industrial-, product-, and interaction design worked together during the summer with four projects.

In total, the three courses and the project were carried out with a user innovation approach, engaging around 75 students in total. Approximately they worked a sum of 13700 hours in 12 different design areas.

Among the companies and organizations involved in this process were; a local start-up company, the municipality of Linköping, Quality hotel, and the research projects

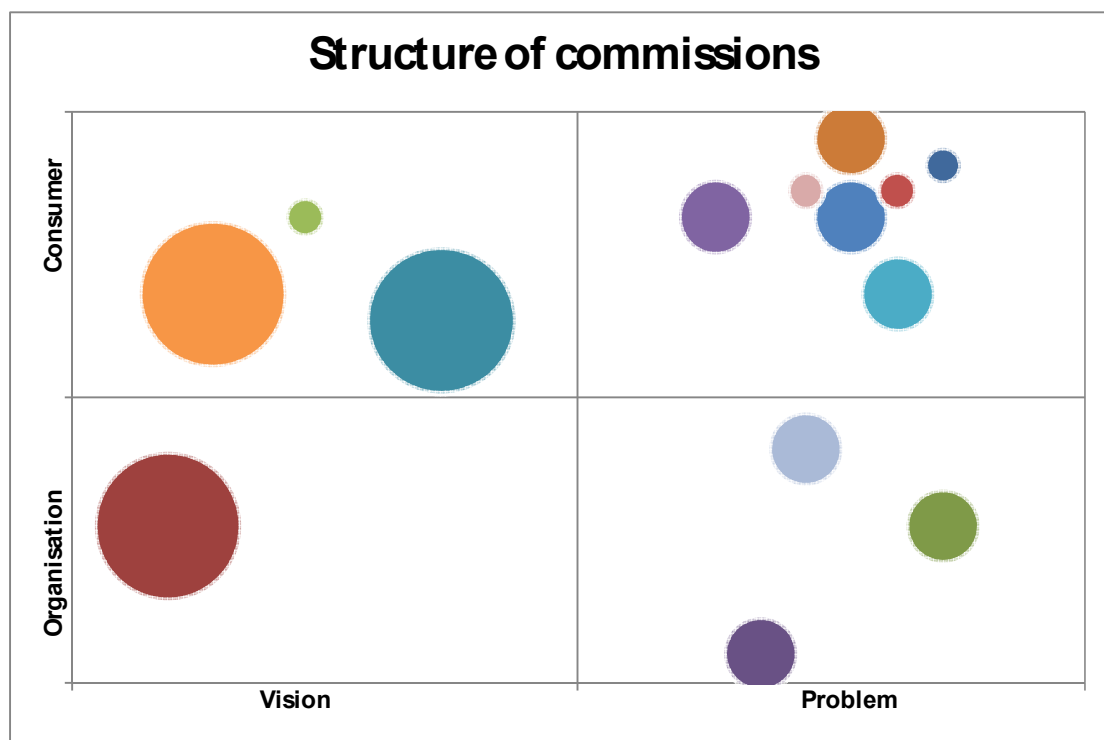
SERV and ICE. The biggest one though, has been Ericsson, contributing with 5 of the design commissions.

Users ranging from the age of 10 to 81 have been involved and a big number of different methods have been utilized during this time. Also members from the various companies have been used to gather data and innovations through ethnographic approaches, workshops, interviews and so on. User groups have been, school children, teenagers, students, truck drivers, families, hotel guests and workers, elderly at home a.s.o.

The biggest contributor to the number of students is a product development course that was held the spring of 2007 where 13 groups worked with companies, organizations and as part of research projects.

6.3 Design areas

The different projects that were performed had different characteristics. Two of the dimensions were whether the commission was formulated as visionary or problem oriented and if the envisioned target for the results of the commission was single consumers or organizations. The structure of the project portfolio can be viewed in the figure below.

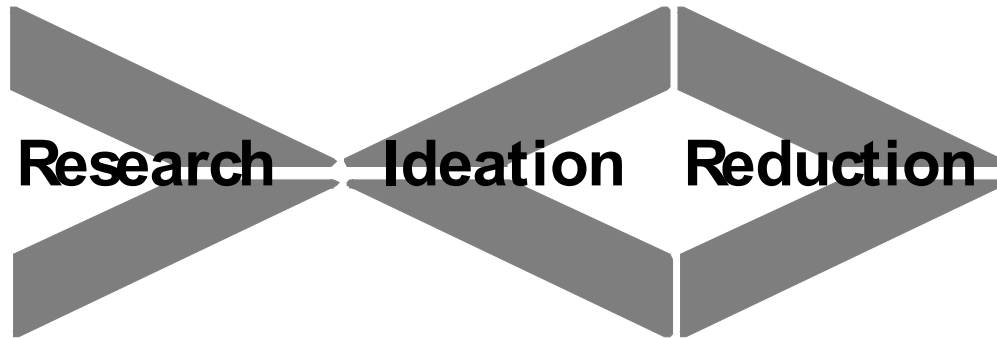


The distribution of the different commissions. Bubble size is the relative size of the project owner.

6.4 Method

The basic structure of the work process (fig. 2) was the same for all labs.

1. Research, often involving design probes (Gaver, Dunne, & Pacenti, 1999) and various design ethnography (Salvador & Mateas, 1997; Spinuzzi, 2000; Millen, 2000) approaches.
2. Ideation, where a lot of different creative methods were used (see table 1).
3. Reduction, involving the users to choose and evaluate the different ideas also included existing techniques and methods.



Basic structure for each design process.

We collected part of the method portfolio at <http://www.ida.liu.se/~TDDD32/docs/Grupparbetet/>.

6.5 The projects

There were four different lab environments set up for the learning lab.

The first was a design studio based master's level course in service design (SD:studio). 5 students participated during a period of 20 weeks.

The second was a course in User Driven Product Development for first year design and product development engineers. 66 students participated during a 10-week period (UDPD).

Third there was a master's level course for Disability Studies students, where 2 students participated during a 10-week period (DS).

Finally there was a Summer Design Office, where 4 designers participated during a 7-week period (SDO).

In total 14 projects were performed, some under several of the different lab environments.

<i>PROJECT TITLE</i>	<i>LAB ENVIRONMENT</i>
InfoTainment	UDPD, SDO
Ericsson	UDPD, SDO
VentureCompetition	SDO
VretaCluster	SDO
SmartTakeApart	UDPD, SDO
ChildrenInMotion	UDPD
ReachingHighAndLow	UDPD
FlexibleStorage	UDPD
PlayingWithFood	UDPD
WhenIGetOlder	UDPD
SingingInTheCar	UDPD, SDO
MobileScreen	UDPD, SDO
HotelService	SD:studio
EnAble	DS

6.6 The lab environments and details

The main characteristics of each lab are described here.

6.6.1 User Driven Product Development

Number of students	66
Hours per student	160
Number of project groups	13
Number of projects	10
Age of users involved	10-81
Size of user groups	1-20
Character of user groups	School children, teenagers, students, truck drivers, families, owners of large cars, elderly living at home
Projects commissioned from	Ericsson, Tools for New Health, Vinnova projects ICE and SERV, startup firm.
Total amount of time from project owners	180
Methods used (no of groups)	Bodystorming (1) Brain sketching (3) Brain writing (3) Brainstorming (6) Buy a feature (1) Design probes (13) Interview (1) Scenario (1) Speed sketching (3) White box (3) Why why why (1)

6.6.2 Disability studies

Number of students	2
Hours per student	200
Number of project groups	1
Number of projects	1
Number of users involved	1
Character of user groups	Mentally disabled
Projects commissioned from	ICE
Total amount of time from project owners	20
Methods used (no of groups)	Design probe (13)

6.6.3 Service design, studio

Number of students	5
Hours per student	300
Number of users involved	15
Hours per user	4
Number of project groups	1
Number of projects	1
Character of user groups	Hotel staff and visitors
Projects commissioned from	SERV and Quality Hotel
Total amount of time from project owners	24
Methods used (no of groups)	Brainstorm Contextual interviews Design probes Design workshop Hat air balloon Interactive scenario Observation Participation Prune the tree Shadowing Speed boat

6.6.4 Summer Design Office

Number of students	4
Hours per student	300
Number of project groups	1
Number of projects	5
Number of users involved	40
Character of user groups	Greentech companies, citizens, car owners, students, cell-phone users
Projects commissioned from	Ericsson, VentureZone, NuLink, VINNOVA projects SERV and ICE, small startup firm
Total amount of time from project owners	120

Methods used	Bodystorming Bug-listing Contextual interviews Design workshops Interviews Make and tell Remember the future White box
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6.7 Methods used

The different methods were used for different purposes in the processes. The methods involved preparing inspirational material and props to make it possible to involve users in research, ideation or reduction.

Some of the methods are tweaks of existing methods, adjusted to fit the specific goals of each case, though most of the methods are part of the traditional design methodology. A lot of inspiration and tools came from the book *Innovation Games: Creating Breakthrough Products Through Collaborative Play* (Hohmann, 2007).

Research	Bodystorming Contextual interviews Design probes Bug-listing Interviews Observation Participation Shadowing Speed boat White box
Ideation	Bodystorming Brain sketching Brain writing Brainstorming Interactive scenarios Make and tell Remember the future Scenario Speed sketching
Reduction	Buy a feature Hot-air balloon Prune the tree Scenario Speed boat Why why why

6.8 Case: The Personal Area Mediator, PAM

During the summer of 2008, three mobile phone usage concepts were developed in Linköping. Four design students, Sophie Andersson, Hanna Lidgren, Susanna Löfgren, and Ester Stenlund Danelius with various backgrounds applied a user-driven approach to a case from Ericsson, a world-leading provider of telecommunication equipment. The project owner was Jan Hederén at Ericsson, and participating as a design coach were Service Designer Andrea de Angelis, now at SMHI.



Linköping University was made possible by a Scandinavian design research initiative, Ludinno, concerning user-driven innovation and a government funded research projects focusing on service design and innovation, ICE. Summer design office is a format made possible by SVID.

The work resulted in three visionary concepts for usage of future mobile technology. The work has attracted a lot of attention. In collaboration between the designers and the media company SitCom Collective, Ericsson presented a set of concept movies at Mobile World Congress in Barcelona in February 2009. The movies were simultaneously released on YouTube.

6.8.1 Design challenge



The objective was to create concepts and mock-ups of mobile units that incorporated a set of attributes described by the client.

- Smart take-apart functionality
(2-4 in- and inter-dependent parts)
- Visionary concept
(e.g. not necessarily implementable today)
- Big screen
(about the size of a A5 paper)

6.8.2 *Conceptual design work*

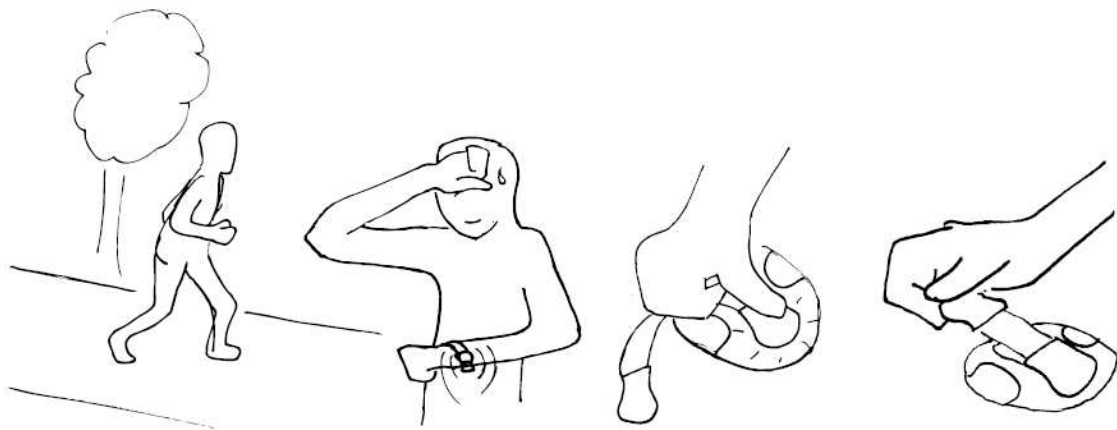
The focus was on identifying needs and behaviors in relation to mobility and mobile technologies. This led to a smorgasbord of use-cases. The concept should include functional parts and describe how they are used and how they contribute to the experience of using the mobile unit. Another requirement was that the final concept was developed together with users in a user-driven process.

Many mobile phones today contain a lot of different components with different functionality. Add-ons such as hands-free and chargers are clumsy and hard to use. There is however, a big competitive advantage in having as many of these components as possible in a single unit simply because it is easier to carry around.

The challenge of this case was to incorporate different components in a mobile unit but still offer the possibility to conveniently separate parts. A number of pre-determined words representing the goals of the design guided the work:

- Innovation
- Adaptability
- Tangible computing

Market research initiated the first phase of the work and helped identify a landscape overview of other offers. The analysis of competitors provided scaffolds for the innovation phase where an understanding of the baseline of technological achievements worked as a springboard.



Harmony ger signal när du har uppnått bästa effekt med din joggingtur

Kroppss-sensorn knäpps tillbaka på basdelen och fälls in.
Information om ditt nuvarande fysiska tillstånd och sinnesstämning memoreras

The target user group was ‘early adopters’ of mobile technologies and the designers used many different techniques to explore the design context. Different user-driven processes like interviews and observations were adopted and the major user contribution came during a workshop where users were asked to create physical models of mobile concepts.

Other user-driven methods applied during the workshop included bug-listing, remember the future and buy a feature.



Some trends were identified during the analysis of the workshop material that could later be represented by three personas.

- Lars, 75. Lives in an apartment in Gothenburg. Alone with home health-care service. Easily forgets things. Children have moved abroad.
- Marlena, 43. Lives in a house in Malmö. HR-responsible at the City Theatre, with a career going. Husband and three kids. Loves her work but sustains fairly loose routines.
- Jonas, a.k.a. Lightfinder, 16. EMO-boy living with his parents in Åmål. Attending high-school, living for his free-time. Writes poetry and listens to Goth-music.



6.8.3 Results

The analysis of various needs and goals of the personas, through the user-driven innovation work led the designers to the final three concepts. These were first

produced as mock-ups and CAD-drawings, and later as physical models of a 3D-printer.



Image source: <http://www.ericsson.com/ericsson/press/photos/index.shtml>

The three concepts are different perspectives on usage of mobile technology. Rather than being distinct and exact descriptions of products, they are complementary views on how mobile technology is made meaningful for different personas in different scenarios.

The organizer

The organizer is all about control and organization. About practicality, correctness and thoroughness.

The harmonizer

The harmonizer is all about well being and balance. About individuality, using all your senses and cocooning.

The exciter

The exciter is all about pleasure, entertainment and creativity. About community, curiosity and being up to date.



Each concept was described with a scenario to clarify how the mobile solutions could be used to satisfy different needs and wishes. Read the report from the PAM case design process.

At a later stage, presentation videos were produced by Ericsson and SitCom Collective. The movies are accessible from the right.

See also

- The PAM report,
http://www.ida.liu.se/divisions/hcs/ixs/case/PAM_PersonalAreaMobility/PAM_rapport.pdf
- An article in Dagens Industri (21 comments)
http://di.se/Nyheter/?page=/Artiklar/Ericssons_framtidsmobiler.aspx%3FArticleID%3D2009%5C02%5C12%5C324129%26words%3Dharmonizer%26SectionID%3DIT%26menusection%3DITTelekom%3BITTelekomNyheter
- A short notice in NyTeknik (16 comments),
http://www.nyteknik.se/popular_teknik/teknikrevyn/article523620.ece
- Jan Hederén presenting the concepts for DN,
<http://www.dn.se/webbtv/ekonomi/framtidens-mobil-har-3d-1.803875>
- News coverage at LiU.se
<http://www.liu.se/liu-nytt/arkiv/reportage/mobiler?l=sv>
- YouTube clips (clicks, rankings/rank, comments)
Harmonizer (9406, 18/4.5, 11), http://www.youtube.com/watch?v=-JBe6YUop7s&feature=player_embedded
Exciter (8307, 21/4, 17),
<http://www.youtube.com/watch?v=PYCycOSoPfQ&feature=related>
Organizer (7528, 12/4.5, 10),
<http://www.youtube.com/watch?v=8RqhAThgIfE&feature=related>
- Covered in BEEP, Telenors Business Customer Magazine, in the Trend section.

6.9 Results

Even though user innovation and user-driven methods have proved to be valuable, the most important lesson learned is the participation of project owners in the process. First of all, even though the direct results from the projects have been of good quality, the most important take-away that the representatives state they had has been things happening in the process.

As a consequence representatives that have involved themselves in the process have been able to integrate the knowledge developed from the user innovation processes in their own work. Second, they have all learned what user innovation methods can do, and what designers can do to mediate these processes.

6.10 Reflections

The work performed in the Linköping Lab has continued in several different ways. The course User Driven Product Development is now established and will run in its third edition in 2010. Since it started in 2008 close to 200 students will have been working with user driven and user innovation methods. They will have had visits from companies such as Ericsson and Acreo, from researchers outside Linköping such as Tuuli Mattelmäki, Kirsikka Vaajakallio, and Froukje Sleeswijk-Visser.

The results from the Ericsson project of the Summer Design Office was developed further during fall 2008, and a set of physical prototypes and three video-scenarios was produced. These were later showcased at the Mobile World Congress in Barcelona, which became news items in Dagens Nyheter, NyTeknik and Dagens Industri.

We continue working with Summer Design Offices, mixing different design competences, and mixing the size of projects; from Sveriges Television to startups.

The Service Design studio course is running in its fourth year in 2010, and has since it started utilized user-driven methods in research as well as ideation phases.

6.11 References

- Gaver, B., Dunne, T., & Pacenti, E. (1999). Cultural Probes. *Interactions* , 21-29.
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7 Reflections and Design Policy

What Kind of Signal is Design for Innovation Policy?

Written by Ilpo Koskinen.

7.1 What is Design Useful For?

Design is not among the most important professions. One has to face this fact after looking at some figures. Helsinki is a case in point. In 2005, it was estimated that there were 412 working designers in Helsinki. Out of the town's 23.500 cultural industry workplaces, this was a tiny portion (Äikäs 2007: 3).⁵ Needless to say that cultural industries, though darlings in the public eye, represent but a tiny portion of Helsinki's total workforce. Also, Helsinki, being the capital and the hub of business decision-making in the country, naturally gathers more than its fair share of cultural industry in Finland.

Why, then, should we look at design, and pay any attention to it in a report like this? The answer of Ludinno is that although design may not be economically a major industry, there are several reasons that justify paying attention to design and its practice from a policy point of view.

The first class of these reasons relate to the actual practice of design and design education, which is reported in detail in the empirical chapters of this report. Over the last decade, design businesses and schools have been in the forefront of creating new research methods for the innovation sector, ranging from new product development to service design and community change.

In particular, should one want to get an idea of up-to-date user-centered innovation practices, design is a good place to look at. Design researchers in North America and Northern Europe – in particular, the Netherlands and the Nordic countries – have adopted new concepts, methods, and technologies effortlessly into their practice, and taught these to students, who have taken them to the workplace.

The key concept in design research over the last decade has no doubt been user experience, which is also an important industrial concept. Methodically, designers quickly adapted first usability techniques into their practice, but also had no difficulties in accepting ethnographic techniques to study the contexts into which their designs end up. Design researchers also adapted and created a host of new “generative” research techniques that aim to assist the creative side of design, not just

⁵ It needs to be said that defining the cultural sector through statistical practice is highly unreliable. Äikäs' figures, for example, include wholesale trade of photographic equipment, but not music industry. Also, some figures are too low; 412 designers probably mean industrial designers only. The problem goes to statistics: small, short-lived enterprises are badly represented in these data, even though they form the basis of cultural industry. Still, the basic message is valid: design is not a major business.

the analytical. Perhaps the best known of these generative techniques is “cultural probes,” self-documentation packages sent not to outer space or the deep seas, but to culture, to document and map people and things they live with. Technically, design research went into the Web early, and started to use mobile technologies early on in their studies. Technically agile, designers are far ahead the social sciences in adapting new technologies to their research practice.

This report gives a glimpse on a wide range of these concepts, methods, and techniques. It also describes how these innovations work not in think tanks, but in “Do Tanks,” places of practice in which designers work with their two worlds, human and technical (Buchanan 2001), and bring in not just students, but also companies.

Thus, the report from Oslo describes the use of “personas” in design, while the report from Aalborg details how a service design process works. The report from Linköping shows some of the actual techniques used in designing services, the report from Karlstad shows how design ideas can be created by simple fieldwork, and the report from Helsinki how these ideas can be built into actual functioning electronic prototypes within a space of nine weeks.

7.2 Teaching through practice, not science

The second class of reasons is to be found in the teaching model of the design universities. In a word, design education has never lost its connection to practice, and this is something we should cherish in rebuilding university education. Unlike engineering, which must form the core of what Herbert Simon once called “the sciences of the artificial” in contrast to the natural and the social sciences, design education is still based on imaginative practice and practical problem-solving, not on applied science. Writing in the 1980s, Simon notes how

in this century the natural sciences almost drove the sciences of the artificial from professional school curricula, a development that peaked about two or three decades after the Second World War. Engineering schools became schools of physics and mathematics.

The use of “applied” concealed, but did not change, the fact. It simply meant that in the professional schools those topics were selected from mathematics and the natural sciences for emphasis which were thought to be most nearly relevant to professional practice. (Simon 1996: 111).

Of course, there is nothing wrong in basing practice increasingly on scientific knowledge. After all, airplanes have to stay in the air. However, in most innovation issues Nordic economies face today, there is a place not only for sophisticated scientific knowledge, innovations cascading from discoveries in basic science, but also for creative pursuits, where innovations cascade from brokering between existing technologies, business ideas, and even art.

There is short supply of ideas and practices that can study those ideas in tangible terms before the innovation chain puts its fingers into the game and starts to fund people with ideas.

7.3 Design Education and Innovation

In understanding how one can build up innovation education that is based on practice, one can look at design schools. They do this in massive scale. Again, this report is useful. It reports work in two engineering schools (Linköping and Aalborg), one university (Karlstad), and two design schools (AHO in Oslo and Taik in Helsinki). What is common to all these programs is a practice that is able in bringing scientists, researchers, students, and companies into the same process to discuss problems and imagine new things together.

For example, Do Tank Helsinki, was a nine-week “module” given in the industrial design program of a design school. It was a cooperative effort of the industrial design department, a company making sensors for cars, and the Ludinno project.

In this Do Tank, students went through a sophisticated, but in many ways still ordinary user-centered design process that started with a design brief and ended with a prototype being tested. As the article later in this book explains, the brief was to study how interaction across the frontbench and the backbench works, and to design ways to enhance this interaction without risking safety.

What students learned in the process was a complicated programming language (C language), electronics, several user-centered design methods, and a research-based way to understand their craft. They built their work on a scientific concept from a Ph.D. thesis from the same program, and used this word, “co-experience,” as the guiding light in their work (Battarbee 2004).

What integrated all these elements was a research-driven design process, and studio environment that was in part specifically constructed for the class. The main element of the environment was a BMW 1989, which was bought for the class. In picture below, one of the students is measuring the performance of her sensors in the car, with class engineer standing in the back, checking figures from his potentiometer.



Here, as in other cases of Ludinno, students had to learn not just knowledge, but also more complex reflexive skills. Also, they had to be able to see their work in research and business context. Needless to say, this Do Tank was multicultural, including students from Finland, Iceland, Germany, and China. It was also multidisciplinary, building on fairly sophisticated sociological thinking, electronics, software, and – naturally – industrial design.

The important point is that this is the pedagogical model of design even today. In design schools (and art schools more generally), there is a link between master and student, and this link is still alive and well. Compared to today's university education, with its overblown classes and thorough scientific agenda, this may look like a living fossil.

However, it is a useful fossil. If one thinks about the whole series of challenges and teachers that a student goes through in design education, it is clear that these students are well prepared to function at the workplace in complex tasks as soon as they graduate. They have gained not just knowledge and skills, but also important experience of how to work with professors, engineers, and company representatives of various sizes, shapes, and colors. And even more importantly, they have muddled through a series of increasingly difficult design processes while learning techniques and tools on the fly in these processes. Some of these processes have no doubt failed, but so do industrial projects.

What could prepare students better for life in industrial innovation?

As far as we know, fairly few universities work like this. Instead, they have taken the track chronicled by Simon. The idea is that students gather knowledge and skills over a spate of years, and show that they master this in their final work. As there is too much science in education, the thing that remains missing is experience of a variety of contexts and processes. It is just this experience that design students get in their repeated rehearsals. In science-based education, it is just this experience that is organized on a haphazard basis, usually through some kinds of summer internships in one company.

7.4 Design as a Signal in Political Economy

For NICE, the main message of Ludinno does not lie in the case studies, nor does it lie in the pedagogic practice in design schools. What makes design relevant for NICE is its signal value in innovation policy work.

In face, several countries have used design this way. Design has been an important part and an inspiration to innovation policy in Denmark, Finland, Sweden and Norway. Also, several other countries have modeled their design and innovation policies using the Nordic countries as a precedent, knowing Nordic practice also helps to understand innovation policy far beyond these northern shores.

As Kolmodin and Pelli (2005) noted in a report that prepared the Swedish policy, there were important differences between the policies of the Nordic countries. For

example, while Finland stressed the link between innovation policy and design, Norway did pay little attention to this link. In at least Finland, strategic design plays an important role in the new innovation policy being prepared by the Ministry of Employment and the Economy.

Also, when European Union set out to create a design policy – which was still in preparation when this report was written – it largely built on Nordic and British experience. Specifically, it built on Danish and Finnish design policies and design policy experience. Thus, EU drives user-centered design, and firmly places the future of design into technological and business innovation, rather than art and education. (EU 2009).

A structural development of another kind is the creation of so called innovation universities that combine business, technology and design. The first one of its kind, Aalto University, was created in Helsinki, and it will begin its work in January 2010. The second one has already been established in Singapore, which has recently got its fourth university, called Singapore University of Technology and Design.

Now, as noted in the beginning of this chapter, design is a small player in economy. Its true importance is better understood only when it is seen as a symptom in political economy, or more specifically, innovation policy. Design plays an important role in these policies, and surely this is not because design is important. It is because something in design practice contains seeds that, if properly nursed, may lead into more innovation-rich world that takes into account people and their worries, brings delight into users' lives, and does this through professionals who are capable in empathy, having a capacity to put on others' shoes and not just imagine a better life, but also build it.

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Nordic Innovation Centre (NICE) is an institution under the Nordic Council of Ministers facilitating sustainable growth in the Nordic economies.

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