Experience Technology – What Should it Mean?

By Gull-May Holst and Bengt-Arne Vedin

Foreword

Teldok has had the privilege of collaborating extensively with one of the forebears to Vinnova, the Swedish Agency for Innovation Systems, KFB (Kommunikationsforskningsberedningen), something that has resulted in a number of reports on future developments in user oriented information and communication technologies. We are happy to see this collaboration pursued in the present report. In a way, it is even more end user oriented since it concerns itself with experiences, thus something intensely personal and private. The 'experience industry' has been much in focus in Sweden for the last half decade or more, with a number of conferences, reports, and research studies dedicated to it. Given its charter, Teldok has its focus on technology, and on end users. We are grateful to Vinnova, and also to the authors. Welcome to experience an old medium telling of many ideas for new ones, adding mightily to sensorial activation!

Innehåll

Acknowledgements

We are deeply indebted to the following persons who generously have shared their knowledge of the experience industry by responding to a large number of complex and complicated questions regarding the present status and the imminent future of the Swedish experience industry. In particular, we thank them for their patience and time. The persons interviewed represent a wide spectrum of research institutes, and public and private organizations. We are grateful to:

Henrik Blomgren, The Royal Academy for Engineering Sciences
Leif Handberg, The Royal Institute of Technology
Anders Hektor, NITA
Kristina Höök, The Stockholm University
Bodil Jönsson, The Lund University
Maureen McKelvey, The Chalmers Institute of Technology
Anna Kelly, The Swedish Agency for Public Management
Ramia Mazé, Interactive Institute, RE:FORM Studio
Kenneth Olausson, Interactive Institute
Lars Rönnlund, The Community of Hultsfred/IUC
Charlotte Wiberg, The Umeå University
Håkan Wiklund, The Mid Sweden University

TELDOK and Vinnova initiated the project. Pernilla Rydmark, Vinnova, has provided the financial sources. Hasse Samuelsson, Bengt-Arne Vedin, both representing TELDOK, and Pernilla Rydmark formulated the questions. In this way they provided an interesting starting platform for this report that tries to look into what an experience industry may be, and what technology platforms are needed to make such an industry grow and develop our society in new and challenging ways.

Thank you to TELDOK and Vinnova for an interesting experience.

Stockholm, March 1, 2005

Gull-May Holst and Bengt-Arne Vedin

1. Introduction

'Experience industry' – in Swedish 'upplevelseindustri' – is the term chosen by some of the Swedish trend setters for what in most other countries is called 'creative industries' or sometimes'cultural industries'. However, there is no consensus among the specialists we interviewed about the meaning of the concept, even if the Knowledge Foundation, KK-Stiftelsen, has made a brave attempt to identify a number of industry and service sectors that are said to make up the 'experience industry'. The Foundation has found that Architecture; Art; Computer games; Design; Fashion; Cinema/Photo; Food and Drink; Literature and Publishing; Market Communication; Media; Music; Performing Arts; and Tourism belong to those sectors which create, package, distribute, sell, and deliver experiences to the consumers.

According to official statistics, some 232.000 persons employed by these industries contributed 109 billion SEK to the Swedish GNP in 2001, equivalent to 4.8 per cent of the country's total GNP. Since then, some specialists studying the area have suggested that sports and gambling should be included as sectors of the consolidated experience industry. Supposing we accept these additions to the already rather fuzzy definition of what an 'experience industry' might be, we have to augment the financial impact considerably – Swedes spend roughly 30 billion SEK yearly on sports, and some 36 billion SEK on gambling. In total, the fifteen sectors thus generated close to 200 billion SEK in 2003.

For those interested in quantitative data about the experience industry in Sweden, Vinnova as well as the Knowledge Foundation have carried out several studies over the past two years, such as '*Svensk forskning – rik på upplevelser*', Vinnova rapport VR 2004:07; and '*Upplevelseindustrin 2003, Statistik och jämförelser*', KK-stiftelsen. Rock City and IUC Musik & Upplevelseindustri in Hultsfred have created and developed an industry growth program called 'FUNK' standing for 'research' (forskning), 'education' (utbildning), 'culture' (kultur), and 'industry' (näring), which may serve as a model for how to build experience industry.

This study is the result of twelve interviews and conversations with researchers and specialists, all involved in sectors defined as part of the experience industry in Sweden. They were presented with 28 questions in five categories. The questions as well as the answers can be found in the Appendix. The starting point was 'what is experience technology', but, given the questions, our study is more of an attempt to find out where this 'industry' is at present, and where it is going. However, it is not so much about the definition of the concept 'experience industries', as about trying to pinpoint and understand what technologies will be of importance for what is seen as an emerging – and merging! – industry.

Obviously, we are facing several problems when describing the experience

industry, not least so regarding the definition of the term, which is made clear by the many different answers to our questions we have received. But we also run into trouble when trying to understand what exactly makes up an experience, and what technologies will be of vital importance for the further development of the consolidated 'experience industry'. If we stick to the definition proposed above, we will have to consider a number of technologies that will be of importance if an 'experience industry' is going to emerge, a development that many feel convinced should be encouraged. The report should be regarded as a snapshot of a field that is still in its very early days of development, but at the same time starting to take shape in new and innovative sectors, providing us with an improved quality of life.

Experience technologies?

Technologies are not necessarily named in an entirely coherent way. Materials technology takes its name from the physical basis of the artifacts involved, whereas information technology encompasses hardware as well as software, components as well as systems, with information, the entity handled, as the foundation for their commonality. When speaking of experience technology or technologies, that commonality must be the end product, the experience.

In that sense, experience technologies would comprehend just everything. A medical operation curing eye cataracts is by many patients described as an experience, as is the result: seeing better again. Yet this activity is part of the medical sector, not in any meaningful sense the experience industry. Getting an experience from a (hypothetical) 3D kaleidoscope might qualify the very same 3D technology as an experience technology. In other words, it is a technology specifically employed to generate, to deliver, to sell (not necessarily in the market sense) an experience.

How have experience technologies been described?

Relying upon Google for a search for the Swedish translation of experience technology generates a puny result, mostly on sports. And while sports in some categorizations do not qualify as part of the experience industry, neither for those doing it nor for the onlookers, sports certainly equal experiences. A number of new technologies have meant radical renewal of old sports as well as the creation of entirely new ones. Modern cross-country skis allow for renewal of something sometimes rather tedious with the old equipment, as well as the new skating style; the klapp skate has opened new vistas for speed skating – all depending upon materials technology. New sports such as windsurfing, rollerblading, skate- and snowboarding, and half pipe also depend upon materials technology. All of these engage our sense of (mechanical) touch and balance; they are, with the established term, haptic.

Again, materials technology is used almost everywhere, so the applications for generating experiences must be more qualified.

In 2003-2004, a number of leading Swedish institutions concerned with technology development issues and with the backing of industry and the establishment in general undertook a major technology foresight project. One of the panels was entrusted with the task of identifying technologies with a potential for paradigmatic breakthroughs. A large number – several hundred – were sifted and sorted, some one hundred qualifying as candidates for such breakthroughs, organized in about a dozen clusters. One of these is interactive technology, with experience technology as one of the nine sub-fields.

Interactive technology (9 fields)	Powerful tools adapted to human capabilities	• Ergonomics for human-machine interfaces • Interfaces (machine-machine & human-machine) • Experience technology • Electronic paper • Education – learning • Autonomous communicating objects • Intelligent sensors and seeing • Telematics such as vehicle control • Image sensors

Here a very specific technology on the component level – electronic paper – appears within the same framework as something that is a very general activity where the idea is that a breakthrough, unspecified, in that field would imply true paradigm shifting: education and learning. Several others are found between those extremes. Many more intricacies might be pinpointed, such as that there are IT based methods being developed that transform learning into experiences and, of course, interfaces that are essential to experience delivery.

Being intoxicated or high on drugs may count as an experience, the mechanism being physiological. Otherwise experiences are mediated by our five senses (or six, if a newly discovered gland detecting unnoticeable smells subconsciously, affecting human reactions and behavior, is counted – or something like 21, suggested in a recent article, see below). Effects may be composite, such as when the balance is affected or when several senses are triggered in combination. Currently, it would seem that seeing, hearing, and sensing via the skin are the senses targeted by new technology development. But there have been attempts to address the olfactory system, affecting smell and creating olfactory communication systems. The olfactory experiences are character-

ized by seven smells (mint, floral, ethereal [pears], musky, resinous [camphor], foul, and acrid – how these stand up after recent discoveries, awarded with the Nobel Prize in 2004, remains to be seen). Skin can safely be said to be the body's largest sensitivity organ responding to pressure changes and vibrations. Seventy per cent of our brain's sensory receptors are clustered in the eyes; in the four skin sensations hot, cold, pain, and pressure; and four (or recently five, *pace* Japan) tastes sweet, sour, salt, bitter, and then Umami.

But we may add more composite signals!

- Kinesthetic sense, sense of balance, vibrations, spatial awareness?
- The ability to speak?
- Ultrasonic and Infrasonic hearing?
- Infrared and Ultraviolet sight?
- Sense of gravity? Spatial Awareness? Extra Communication?
- Synesthetic capabilities?

The last point, synaesthesia, refers to the strange case of mixing senses. Most frequently, we are talking of people who experience sounds, letters, numbers, or words as colors. But it may also be the case of letters having an aroma, of some kind of crosstalk between different sensory areas of the brain. In a recent issue of *New Scientist* (29 January 2005), the argument is discussed that there are at least ten senses, possibly as many as 33, depending upon definitions perhaps, but also on discovery. The cover story starts out with an experiment: Close your eyes – stretch out your arms. How do you know where they are? Now wiggle your fingers. How do you know that they are moving? Now do it all again, eyes still closed. Did you fall over, and if so, did it hurt? – And now the question: what senses were involved? Certainly not the five ordinary ones.

For the larger number of senses, the article distinguishes between three types of pain, cutaneous, somatic, and visceral. Mechanoreception divides into a list of seven categories, of which some should be grouped together, but differently, so as to create a maximum of five senses; the seven are: balance, rotational and linear acceleration, proprioception – joint position, kinaesthesis, and two types of muscle stretch, Golgi tendon organs and muscle spindles. Finally, there are a maximum of ten interoceptors, that is, 'body internal' signals, thus senses: arterial blood pressure, central venous blood pressure, head blood temperature, blood oxygen content, cerebrospinal fluid pH, plasma osmotic pressure (they add a question mark: thirst?), artery-vein blood glucose difference (another query: hunger?), lung inflation, bladder stretch, and full stomach. – If these were indications of opportunities for developing technologies that affect them, the frontier would seem vast and unexplored indeed.

Theatrical dimensions? Or intellectual?

In classic theatre, the rules are to maintain the integrity of time, space, and action. Joe Pine of Strategic Horizons has proposed a three-dimensional categorization of experiences resembling the rules of theatre, adding to time and space the dimension of matter:

Matter = atoms	<–>	no matter = bits
Time = linear	<–>	no time = non-linear
Space = real	<–>	non space = virtual

The experience might also fall into one or several of the three categories of hand, head, and heart. 'Hand' stands for an experience that is physical, 'head' for one that is intellectual, and 'heart' for one that is emotional. Talking about head and intelligence, Howard Gardner has produced arguments for the existence of seven types of intelligence; social, intra-personal, mathematic-logical, musical, spatial, verbal, and artistic. While suggesting that these correspond to different types of experiences also, music may for example imply both an experience for the head and the heart; dance, which is spatial, one for all three categories.

In the media, there are often distinctions made between entertainment, information, and education; then there are hybrids such as infotainment and edutainment. Mamamedia.com relies upon the pedagogic principle of substituting 3R (reading, writing, 'rithmetic) with 3X (explore, exchange, experience or express). De Bono's six thinking hats concern themselves with facts, with problems, with opportunities, with emotion, with new ideas, and with the process of thinking (around a particular phenomenon or problem) itself.

Interfaces?

Yet another way of seeing is when talking about human-machine interfaces, which may be described in four dimensions, physical, cognitive, emotional, and synaptic. Only the last probably needs some elucidation: it is about connections to other resources important to the user's experiences.

Obviously, our senses get their inputs by way of some kind of interface in a general sense, the interface possibly the scene of the theatre or the scenery of Grand Canyon. Thus new interfaces would be one simple suggestion for experience technology development.

As at the theatre, something is found behind the scene, and that machinery may be essential. So there is some kind of hardware and software platform, allowing the director to have the play performed. That script, those directions or directives, then, constitute the actual software program.

Thus we see a sequence:

- Hardware technology platform: allowing for

- Software technology platform that may contain its own novelties but still hardware dependent
- Actual software program, decisive for what is
- Played out at the interface
- Affecting human sense(s)

When it comes to new materials, such as those allowing for new sports experiences, they are hardware combined with interfaces, and the soft side is basically the ingenuity in morphing traditional sports or inventing new ones.

Enough resolution?

One route to further experience development would be higher resolution, up to the limit where it 'makes no difference' to the sense activated. Movies defy the eyes' temporal resolution over and above a certain number of frames per second, and sufficiently fine-grained film or sufficiently large numbers of pixels do as well. In addition, new discoveries and techniques would add to experiences. The recent new understanding of that powerful sense the olfactory might well have thorough ramifications on technologies employed to generate powerful sensations.

Resolution must be high enough also over time. Thus whatever the interface producing sufficient resolution, it has to be able to change sufficiently fast, and the driver, the underlying technology platform, must allow for a large enough bit rate to produce a smooth impression. An experience has duration; it is not a product but a process in time. This holds also for, say, the experience of art, generating reflection and associations with other art experiences.

For visual and auditory impressions, the resolutions needed to deceive our senses are well known. Tastes have been tested and tried by chefs de cuisine for centuries, and that the body is selectively sensitive to touch is demonstrated early on in basic courses in psychology. The human nose is known to have the faculty of distinguishing between perhaps ten thousand different smells. For more integrated experiences, touching for example on balance and movement, amusement parks with roller-coasters and merry-go-rounds and experience tours as well military applications affecting, say, submarine or airplane pilots provide solid foundations of knowledge. More recently, computer gaming has if not taken over at least contributed to such foundations. Resolution applied to olfaction, however, is less well known; perhaps there is the need for the development of a descriptive language.

Thinking of olfaction means pinpointing the fact that sensations and experiences may be intensely personal and individual ones. An odor may evoke memories carrying associations the origins of which have been long forgotten, possibly recorded subconsciously only. Thus, what is a profound experience for one person may well leave another entirely cold. Possibly, a clever experience animation would start by providing a subconscious background by evoking several of the other senses.

Conventions and combinations?

There is also the importance or habit or convention. In the early movie farces, Keaton or Chaplin could take a severe beating with no apparent side effects. Such movies shown in other cultures generated awe about the seemingly inhuman sturdiness of white men. Or when black-and-white photographs were shown to people in Abyssinia, these observers could not understand the flat records as representing live people a hundred times larger. So we see that every medium (like many other expressions of human activity, such as mathematics) come with conventions that are integrated and internalized to the extent that we take them to be natural while they decidedly are not. The question, then, is what conventions will be created by new experience technologies (like once photos and movies created some), including techniques geared at olfaction.

Conventions apart, there are cognitive effects such as saturation, after-effects, illusions etc, of which optical effects and illusions are the most often exposed. Experience technologies may develop to be employed to create such effects, sensations, indeed experiences. Again, there would have to be appropriate software programs designed to achieve such results.

Given that a sensory experience is dependent both on its larger environment, conventions absorbed, and personal history, and hidden associations, an experience would seem to comprehend much more than a few moments of 'experience production'. Models of processes of innovation have progressed from simple linear ones to 'chain-coupled' and increasingly sophisticated ones, including feedback and linkages outside the organization chiefly responsible, stretching widely in space and time. The same holds for design: while a simple description starts with a design brief and ends with the finalized product, more intricate models recognize that the problem preceding the brief most often is fuzzy and ill defined, and that designer and problem space are part of one and the same entity. Such reasoning is found behind Donald Schön's and Chris Argyris' 'reflective practitioner', and have been dealt with thoroughly by Gerdenryd.

Thus, the point here is that the same seems to hold for an experience. Certainly the experience producer intends to generate something worthwhile experience-wise, but the 'customer' is a very active contributor. David Perkins has, in a work on experiencing art, described how previous experiences, that is, in a general sense, knowledge, often tacit, may contribute to a heightened experience. This heightened awareness may be seen as generating increasing marginal returns out of existing (as mentioned, sometimes tacit) knowledge. 'Increasing returns' stands for positive feedback, for more generating even more, generating still more. The challenge for the experience producer, applying various technologies, would then be to assist in generating those generous returns.

The 'increasing marginal returns' analogy is one purloined from economics. Another picture might be taken from the mathematics first pioneered by Paul Erdös, the recently expanded one of linkages or networks. Think of an

enormous set of buttons. These are one by one, or rather two by two, randomly strung together with strings. For a long time nothing much happens: isolated links tie together a few buttons, one to one. Then, at an alarming rate, above a certain threshold of linkages, just about every button is fast becoming linked into a now almost all-encompassing network; this run-away process has been compared to phase transitions in chemistry or physics. In this analogy, the challenge for the experience producer might be phrased as arriving at and exceeding the critical avalanche threshold.

Experience science – not a new concept

Thinking about and trying to understand experiences is by no means a new phenomenon, not even a new science. 15th century artist Lionardo da Vinci was fascinated by the mixture of odors and colors in Venice, and then regarded as the capital of color pigments. He is said to have mulled over how to depict the odors of the city in his drawings. Isaac Newton carried out his famous experiment – *Experimentum Crusis* – on light and colors in 1665, which resulted in Johann Wolfgang von Goethe opposing his findings in his '*Geschichte der Farbenlehre*' in 1810. Goethe understood that there are links between colors and experience. He writes:

> "*Since color occupies so important a place in the series of elementary phenomena, filling as it does the limited circle assigned to it with fullest variety, we shall not be surprised to find that its effects are at all times decided and significant, and that they are immediately associated with the emotions of the mind.*"
>
> Johann Wolfgang von Goethe: *Theory of Colors, (Geschichte der Farbenlehre)*, translation by Charles Lock Eastlake (London: John Murray, 1840), from the chapter "*Effect of Color with Reference to Moral Associations*"

Among Goethe's admirers was Ludwig van Beethoven who saw links between colors and music. However, parallels with music and colors were already mentioned in 1786 by Johann Leonard Hoffmann who compared visual and aural phenomena. Goethe even summarized Hoffmann's linguistic, chromatic-musical synthesis in his '*Geschichte der Farbenlehre*'.

Much more remains to be said about the 'history of science of the experience industry' but we shall leave it at this, just as a reminder that however new we may find this composite industry, much has already been explored. There is a rich mine of wisdom out there, not only in the recent research results of modern scientists, but also in the thinking of the great artists, musicians, philosophers, choreographers, and scientists of earlier centuries – the composer Richard

Wagner for one dreamt of the total piece of art, das Gesamtkunstwerk, that would encompass all human senses simultaneously.

Bearing all of this in mind, Sweden has made an interesting choice when using the denotation 'experience industry' rather than deciding on 'cultural sector' or similar terms. 'Industry' offers many challenges to new inventions, many opportunities to cross fertilization, many chances to let the user participate in the design and development processes. At the same time, it may limit us to stay with outdated linear thinking patterns, developed for the manufacturing industry when we should need to move to the multilayered thinking processes of the service and communications society, this society based on experiences. As shall be seen, debates on the definition of the experience industry are about to begin, at least judging from our findings.

2. What the Experts Conclude

The following 'bullets' are some conclusions we have drawn from the answers the expert we interviewed gave us. Deeper analysis of the responses may lead to different results – which is why the responses are included in the appendix, so that each reader can see for her-/himself what alternative conclusions there may be.

Definition:

1. There is no consensus among the interviewed persons on the actual definition of the experience industry. All interviewees have commented on the various sectors proposed by the Knowledge Foundation, KK-stiftelsen, but no one has accepted the definition as it stands. A few expressed that the experience industry is limited to sports and outdoor activities, some said that media generate experiences, some pointed to the role of experiences in our daily lives, and others stated that the 13 original sectors identified by the KK-stiftelsen only make up a very small part of the industry – all society should be included. Geographical location is also seen as belonging to the definition – outdoor activities generating experiences in some parts of our country, indoor ones offering the greatest opportunities in others. The general conclusion is that further discussions in order to develop common and sustainable definitions among the actors are needed;

Create a coherent experience industry:

2. Sweden should create a coherent experience industry based on common qualities and definitions and values. Entrepreneurial individuals, regional initiatives, as well as local ones should somehow be networking in a national initiative;

Experience – cognition – senses:

3. There is a general lack of knowledge of what an experience is, of what makes an experience an experience, of what makes a memorable experience, and so on. More research is needed in order to understand how individuals react to experiences and what common factors there may be to different kind of experiences. Part of this is a need to penetrate and understand how all human senses work one by one and in collaboration, consciously as well as unconsciously. Cognition, perception, haptics, emotions, are some areas for further research and development that were mentioned by a majority;

Coordinating centre – fora for meetings:

4. In order to make the experience industry a true growth area, some sort of national, coordinating centre is needed, a centre where multidisciplinary research related to the experience industry can be carried out. National, regional and local fora for persons wanting to discuss and collaborate are needed/wanted; (The Knowledge Foundation is sponsoring five meeting places for the experience industry across the country in order to generate new developments – Hultsfred [music]; Karlshamn [computer games]; Hällefors [gastronomy]; Trollhättan [movie production]; Piteå [acoustics/sound]. Once evaluated, these may set a pattern.)

Dissemination of research results:

5. More effective dissemination of existing research results in all areas related to the experience industry is judged an urgent need, also serving as a central knowledge and competence base;

Experience technologies:

6. Technologies judged important to the experience industry:
   - mobile communications including broadband and wireless connections to all homes for online media and ubiquitous communication
   - a wide variety of easy-to-use and cheap interfaces for any kind of artifact
   - sensors for every one of the human senses, sensors that communicate, for instance haptic networks and odor sensors – 'the artificial nose'?
   - non-voice based mobile services, such as emotional ones
   - Bluetooth platforms that are much more flexible and available for many more artifacts and services
   - animation
   - affective loops
   - virtual reality and 3D
   - emotional networks
   - emotion-based systems
   - embedded systems
   - immersive technologies
   - security systems
   - smart materials
   - smart textiles
   - gesture recognition
   - nanotechnology
   - biotechnology
   - collaborative networks

- collaborative software
- design in general terms, in particular design as a method for the development of technology for society at large, including conceptual design
- research on content and quality of content
- research on how to utilize the large number of global networks surrounding us as a kind of invisible, virtual 'ceiling'.
- E-cinema
- E-film production
- E-books
- presence production
- reality production
- interface design
- middleware
- signal recognition
- transmission
- pervasive technologies
- wireless, smart home technologies
- RFID technology
- morphing
- motes

Collaboration with traditional industry:

7. Close collaboration with Sweden's traditional industries in order to develop new products. One instance is the famous Ludwig Svensson textile mills which are collaborating with researchers on how to produce smart textiles for a host of applications such as interior design, energy saving, fashion, medical usage. Integrating new knowledge with the existing one.
   "The experience industry will not be successful until it is found in the iron mines of Lapland". (This is on its way.)

Research on the management and organization of multidisciplinary collaboration:

8. Research on how to manage and organize multidisciplinary research and collaboration is important for the future success of the experience industry. The development of collaborative software could be one part of it. These matters tend not to be even spoken of, in spite of causing frustration and ineffective, sometimes even aborted, projects;

Design for the user:

9. Sweden has a great tradition in design centered on the human being, the individual, the user, the consumer. Swedish design is known for considering

social aspects and impacts – how can this be developed? Esthetics must be part of it – "my computer is designed by Ferrari – it is beautiful!"

10. The user must be involved in the design process. The user will demand attractive quality related to practical quality – users will want to participate in the creation of new products and services. Different options must be presented to the users during the development process – if not, how could they choose? The manufacturers have to collaborate closely with users;

Definition of strengths:

11. Defining Sweden's strengths and weaknesses as related to the experience industry and developing platforms from the strengths. Homogeneity of the population and a high level of technology awareness make Sweden an interesting test market. We should combine everything we are good at and look into what can be developed based on the research results and technologies we already have;

The market is global:

12. Whatever we develop, we should understand that the market is global. Trollywood competes with Hollywood, the tourist sector with the rest of the world, and so on. The packaging of each product and service is crucial for its success. The web sites must be enticing also to an international public.

13. Branding is very important;

14. Using a global language is vital for success;

Understanding the market:

15. It is important to understand if a product or a service is for the mass market or for the connoisseur, uniqueness could be considered as a competitive advantage in some contexts;

Links:

16. Links are developed in an ongoing process. Often one or two persons who see a need for contacts across borderlines build them. Border lines between a large number of disciplines are becoming more and more fuzzy, multi-disciplinary projects are happening – the Media Technology Department of the Royal Institute of Technology collaborates with the Opera School developing the feeling of participation and telepresence using dramaturgy and narrative techniques. The RE:FORM Studio collaborates with the

textile company Ludwig Svensson and the Swedish School of Textiles at the University College of Borås on developing smart materials. The Mid Sweden University collaborates with leading orthopedic specialists on developing safer ski board equipment, preventing physical damage. The examples can easily be multiplied. All the same, there are many links still missing, for instance links between public and commercial service providers, between content producers and artifact developers. "It is vital to develop knowledge about each other's research areas in order to develop links between sectors";

17. There are already a number of multisector/multidisciplinary projects going on in the research institutes. Careful mapping of the most successful ones and the most unsuccessful ones should be carried out in order to define what exactly made them successful/unsuccessful, in order to find out how collaborative methods, management, and organizations can be developed for future use on a larger scale;

18. There is a lack of financing for multisector projects, which is why the experience industry finds itself in a slack period;

Semantics:

19. Experiences are a matter of semantics, of how we interpret and understand, of the signification of technology and design. Differences are generated by different technologies – these implicit significations should be made explicit to the user. Also, semantic interoperability is a basic requirement to make our daily life more efficient and richer;

Social and ethical considerations:

20. Many difficult social and ethical questions related to who sets the limits, who is in control, where are the limits that cannot be surpassed, integrity – all these questions should get answers;

21. Filters and filtering functions will become necessary as we are becoming more and more dependent on online communication;

22. In developments for the experience industry we must encourage a high sensitivity to the many risks implicit in the technology. The individual will be extremely vulnerable to over stimulation, information fatigue, all kinds of dependencies, lack of reality contact, and so on. Moreover, we will be exposed to a number of unsavory services and offers – how do we choose? The integrity of the user must never be abused. Some researchers collaborate with psychologists in order to understand how physical acci-

dents happen. Maybe there is an opportunity also for learning how to avoid negative mental impacts? Maybe ant technology should be developed?

Understanding reality:

23. Understanding reality, how reality differs from the virtual world and how to recognize reality, becomes of vital importance. We have to teach our children the balance between real life and virtual life and the dangers in not knowing the difference;

Technology a medium:

24. The experience industry is about interaction, thus technology should be regarded as a medium for interaction, among other things. Technology per se is not the goal;

25. It is vital to define and measure the user's needs and demands, her vision of quality, and what changes are happening over time;

Developments for handicapped people:

26. Development with the handicapped in mind, of anything from new materials to clothing with embedded security systems, for all kinds of outdoor, nature related activities and for event participation via for instance telepresence has high priority;

Challenges for young competence:

27. Generally speaking, we must become better at using people with bright ideas and offering challenges to young, competent people if Sweden wants to have state-of-the-art competence in the experience sector;

Small, cheap, easy-to-use:

28. Future artifacts should be small, cheap, and easy to use. No manuals. All should be able to communicate;

More innovative products and services:

29. More innovative products and services are needed, new ways of thinking and designing are musts;

Synergies:

30. Synergies between all sectors should be looked at carefully and developed wherever possible across all walls, borders, lines…

Active technology:

31. There is a shift in technology from a passive one towards an active one – what are the implications for the users?

Change of mindset:

32. We are seeing a change of mindset – we are expecting experience to be part of everyday life and will not use products and services that do not offer experiences;

33. The linear thinking models of the industrial society must change to the more chaotic, multitasking models for the service and communication and experience based society;

Transparent systems:

34. All systems should be transparent to all other systems. Portability from one system to any other a must;

Customization:

35. There is a great need for customization of the products and services of the experience industry – what are the deep implications of customization? Today we are offering several alternatives, ready-made packages, but that is not what customization is about. Customization involves participation by the end user;

VR studios for the development of products and services:

36. Virtual reality studios are used for the development and testing of products and services for the experience industry;

Light product versions:

37. Light versions of software products once made for sophisticated specialists are becoming ubiquitous. CAD/CAM, editing software of all kinds, media production software, etc., are eliminating the need for deep expert knowledge in many fields. More and more services can be carried out by non-specialists. What are the implications? Do we lose knowledge that may be needed?

Statistics on soft values:

38. There is a whole lot of statistics on hardware distribution and usage, but we do not know a lot about the soft values and the way people evaluate and use services. We should know what people think about reality, experiences, relations, how their values change over a period of time, etc.;

Emotion based systems user controlled:

39. Emotion based systems must be user controlled and the systems can be manipulated by the user;

Tangible vs. intangible values:

40. What is the role of tangible values versus intangible ones when constructing virtual worlds? Why would an Internet bank want to buy a big building? What is the collaboration between the real and the virtual experiences?

Experience for learning:

41. It is a well-known fact that you learn better and faster the more of your senses that are involved. Experience based learning for the school system at all levels should become a top priority. However, the teachers must be the first ones to get appropriate training;

Identifying the short- and long-term winners:

42. We have to identify the short- and long-term winners among all the opportunities we have, and then prioritize accordingly. This should be a national effort!

Create industry awareness:

43. The industry in general is not aware of the new opportunities they may explore and exploit, by employing students having graduated from the experience related educations. Most of the industries do not even know their own needs for experiences and communications in all the significations. Industry awareness should be created, as well as students' awareness of the industry;

New strategies for communications services:

44. Offensive, multichannel strategies offered by the communications providers, giving the user the opportunity to pick those services she/he finds most useful, and paying for all communications services by one transparent invoice no matter what she/he chooses – no more overlapping services with different invoicing systems and multiple payments;

Commuting between experiences and boredom:

45. We will have to learn to commute between experiences and boredom!

3. The Future of the Swedish Experience Industry – The Communicating Society?

"It would be a great shame if the experience industry stops at sports, events, and tourism! It must be part of every aspect of society!"

Professor Kristina Höök, The IT University, Kista

Many of the experts interviewed for this report expressed the viewpoint that the experience industry ought to be defined in such a way that all aspects of life may be included. In reality, the concept of an all-inclusive science becomes unwieldy – after all, science thrives on the establishment of well-defined borders, with delimitations to subjects, methods, etc. In our introduction we defined experience technology as 'a technology specifically employed to generate, to deliver, to sell an experience'. However, as a basis for future discussions about what a Swedish experience industry should and could be, we would like to share some input we have received on the role of experiences in our daily lives, in areas of concern to the social security services. Having strong traditions in social engineering and a competent public sector with knowledge of solutions for society at large, Sweden should take the lead in creating a communicating society, in which experience plays a vital role in increasing quality of life for all. This development should start with the individual, be she/he a very young child or a very old person and anybody in between in need of care.

The CERTEC Institute of the University of Lund, headed by professor Bodil Jönsson, is involved in design for 'the human sector', i.e. in designing solutions carefully adapted to human beings. So are the IT researchers at the IT University of Kista and the media researchers at the Royal Institute of Technology. In fact, for most of the research organizations represented in the interviews, the major concern seems to be how to improve our quality of life through experiences, whatever an experience may be. Such future developments of experience based technologies and of technology-based experiences have to become part of daily life, since experiences are. Such a concern involves covers issues like developing systems for all sectors of social security, anything from daycare for young children to care of the very old and demented persons in clinics and at home, from primary schools to medical treatment, in brief any aspects covered by the services included in the social security system.

Professor Jönsson's starting point is the individual. In her paper *'Design for the human sector' (Design för den mänskliga sektorn*, jan. 2005), she defines the human sector as the one where individuals work for other individuals. In each

situation, at least two human beings meet in order to solve problems, often practical ones, for one of the individuals involved. There is a lack of attention to daily, repeated work, solving often trivial but very uncomfortable situations for those involved. Thus only very few particular efforts are being made when it comes to developing and designing methods, systems, technologies, devices, artifacts, whatever, that can alleviate daily struggles. This is the case in spite of the fact that technologies exist and that the human incitements are large. Some progress is being made in design for the physically handicapped, at least for some groups. However, the old, demented, physically ill, and lonely individuals are so far left to their own, as are those who care for these human beings, often family and relations.

The Swedish society is good at large scale infrastructure but not at small scale, individual infrastructure. This may have to do with the fact that individuals exist only in relation to their direct association with a so-called 'platform', i.e. an acknowledged – and utilitarian – organization. Individuals having a value as such and being able to contribute in spite of not belonging to such an established platform is a somewhat difficult concept for Swedish society in general to accept. This lack of individual recognition, this need, offers a number of opportunities for the development of the experience industry. It starts with design for new ways of regarding the individual. Professor Jönsson points to a number of salient facts. The first one is that those employed in the caring and educational sectors rarely have an opportunity to discuss job-related problems to which there might well exist technical solutions. The specialists mastering technical knowledge rarely involve those having the content knowledge before starting their design task – for instance, architects designing a school never talk to those who use the school, i.e. the students, pupils, and the teachers. They just talk to the decision makers. The situation is the same for most other designs for public service – the users, the specialists on the contents of the service, are rarely, if ever, involved. (It would be fascinating to see a school with pupils and teachers actively involved in its design!)

According to professor Jönsson, other facts of importance for design for the human sector are:

- the quest for meaning
- flexibility
- the uniqueness and the personal
- the quest for company
- the constant threat of the paralyzing 'Great Danger'

What we are talking about is the ultimate customization, the individual, one-of-a-kind adaptation of technologies, design, design methods, experiences… anything that can make life easier and more pleasant for otherwise marginalized persons (which goes towards the 'transformation' heralded by Joe Pine III, individualized experience).

What the experts say

Bodil Jönsson is not the only one searching for design for the human being. Quite a few of the experts interviewed have expressed similar views. Some quotations:

"Experience must become a part of the daily life for the average citizen. Sweden has a formidable position when it comes to developing technology for the experience industry, which should form an important part of all sectors of society, including social services, heavy industry, tourism, education, politics, and so on."

"It is difficult to define what an experience industry may be – in a way it is providing an extension to the service society, offering more and more products and more sophisticated services."

"Sweden has a great tradition in design for many different purposes. We should develop this tradition for the future since design so far always has started from the human being, from social considerations. This becomes particularly important since design will be the making or the breaking of new products and new services."

"The discussion should be more about how to make experiences the central issue in the public sector. The Social Security Insurance has to offer me security as well as integrity and easy-to-understand and transparent services whenever I need them. There are too many tautologies in the definitions."

"Personalized technology in the sense that we can have more and more personalized artifacts; cultural factors will become important, so we will have to ask how the cultural experiences of different groups are integrated socially and individually."

"Since decisions on what technology is offered on the market influences everyone, also very marginal users, it is fundamental to understand and integrate other peoples' values, cultural ones as well as mobile ones, in order to achieve integration."

"Since we are working at integrating experiences in every phase of society, as IT engineers we are collaborating with many other disciplines – sociologists, psychologists, neurologists, artists of many varieties, musicians, film producers, chorographers, virtual architects, etc."

One conclusion is obvious – that experience can be incorporated as a vital element in our public lives. Once we know how to customize, once we have sensory systems for all senses that are communicating will all the other artifacts, once we can mediate experiences, involving hand, head, and heart, then we may be successful in adding new qualities of life also to the public services. However, the fundamental basis for a well functioning human environment is trust, trust in one's environment, trust in one's fellow human beings. Trust is also a foundation for people's acceptance of new technologies, including experiences – mistrust is to the contrary. What direction do we want to take, what choices to make?

Whither the experience industry

The experience industry shares with the service sector the feature of being heterogeneous, something, which makes for risks of over-generalizing trends, patterns, or characteristics that pertain just to part of the field. Thus the discussion of definitions is no idle undertaking but essential – for the future! Essential it is, also since new or newly defined phenomena need quantitative and qualitative underpinnings, such as statistics.

With the emergence of every new interdisciplinary field, there is the emergence also of its own descriptive language, associated methods, recognized peers, etc. Philosopher of science Ludwik Fleck described "the creation and development of a scientific fact" as depending upon the emergence of a thought collective and carried by a thought style. From the diversity of our interviewees, and their responses, one might infer that neither exists as yet, not in any established way, certainly not in a conclusive or polished one.

As mentioned early on, in other countries, cultures, or languages another concept, such as 'creative industries' may be preferred. In a retrospective study of the evolution of the concept of 'Business Process Reengineering', BPR, it was noted that at about the same time, some half a dozen concepts or descriptors were suggested for more or less the same phenomenon, where eventually won out. 'More or less', since emphases varied a little between the different suggestions. It remains to be seen whether one or several concepts will be needed and so much needed that the will stay alive but in limited circles.

'That which is said obscurely is also mentally managed obscurely'. This is to say that new concepts may be powerful in categorizing, defining, and getting a handle on important phenomena. There are many examples of newly emerging needs being overlooked until the day that they are defined, given a name, and recognized as of importance. Then, and only then, investments are pouring in.

Might it be that the Swedish focus on an experience industry risks leading the country up a blind alley while other nations pursue a more promising route? Or is precisely this Swedish concern constituting a competitive advantage? Perhaps the most sensible strategy to pursue is to take a leaf from Fleck's book and consciously work on establishing a thought style and a thought collective, all the while letting the 'experience industry' productively interact, contrast, and compete with, reflect and draw upon concepts such as 'creative industries'.

Appendix
This is What the Experts Say –Interviews

The Experience Industry – Definitions and General Reflections:

A. Questions Regarding the Experience Industry

1. There are many definitions of the concept 'experience industry'. In your opinion, what definition do you find the most relevant?

- The experience industry will never be of importance until it finds its way into the traditional, heavy industries of Sweden, such as the mines of LKAB and the forest products industries;
- The experience industry must include development regarding implants for the handicapped;
- Rather, it should be experience within industry in general than experience industry;
- Large public events in stadiums/arenas/specifically designed platforms; television experiences; mobile games; computer games, individually or in networks like the Internet; gambling; gaming;
- The fact that human senses should be involved in generating experiences, such as sight, smell, the touch system and the rest. The technology should either enhance new experiences or reinforce the actual humans senses involved. Maybe both?
- Experience must become a part of the daily life for the average citizen. Sweden has a formidable position when it comes to developing technology for the experience industry, which should be an important part of all sectors of society, including welfare services, heavy industry, tourism, education, politics, and so on. One example is found in Lapland, where the Ice Hotel in Jukkasjärvi – already an international concept being exported – is developing new packages of experiences in collaboration with LKAB (the state owned iron ore mines in Kiruna), the Kiruna city authorities, and the Swedish Space Corporation, involved in many space experiments and space research. Moreover, the very city of Kiruna is being moved because a new layer of iron ore recently found under the present conglomeration is going to be exploited. These four entities have decided that they have a lot to offer those interested in experiences. Moreover, they are utilizing their northern location by offering testing beds for new automobile prototypes under severe conditions, their splendid nature and much more. It is a matter of collaboration, utilizing

the technology available, finding the best ways of packaging the services and putting them into a meaningful context;

- It is all about creating attractive products and services making experiences a possibility. In order to create attractive experiences, we have to understand how perception works – what it is that makes an experience attractive?
- It would be a great shame if the experience industry stops at sports, events, and tourism! It must be part of every facet of society!
- The experience industry is a matter of how we understand, of the signification of technology and design – what technology do we mean, the technology we utilize or the technology the receiver meets? There is a difference generated by the technologies;
- The experience industry is about interaction, we should see users rather than customers. It is also a matter of immersive technologies. Technology is really a medium;
- The experience industry concept is diluted and does not mean very much – there is no such thing as an experience industry;
- Technological determinism prevails, but we really have to ask all the difficult social and ethical questions. Where are the limits, and whose limits are they?
- There is a lot of confusion – part of the sectors is true sectors, others are research disciplines, and others again are application areas. Maybe we should start to look at vertical and horizontal definitions, vertical ones being for example architecture, horizontal ones application areas;
- It is difficult to define what an experience industry may be – in a way it is providing an extension to the service society, offering more and more products and services, incorporating experiences;
- When we have convinced, for instance, the elevator manufacturers to launch a service that offers the music industry an opportunity to introduce new music and new artists in all the elevators of Stockholm during a February week, and the following week in, say, Sundsvall, then we have created new synergies that present new experiences to prospective consumers. This is what the experience industry is about;
- 'Experience industry' is not a very valid term, 'industry' refers to production, we should use the Swedish term 'upplevelsenäring' instead. After all, there is no such thing as an 'experience industry', no true conglomerate exists;
- Experience is not about technology, it is a symbiosis of services, products, innovation and personal qualities. It is about understanding the human being;

2. In Sweden, the Knowledge Foundation has defined the 'experience industry' as being made up by thirteen sectors (architecture, design,

film/photography, arts, literature, marketing communications, media, fashion, music, food and drink, performing arts, tourism, experiential learning). Recently the number has increased to 15, since sports and gambling have been added. Are there natural links between all/some of these sectors? Which ones?

- There is an awareness of the difficulties of developing links between different sectors; all the same, the value added by developing such links is enormous;
- It is vital to develop knowledge about each others' research areas in order to develop links between sectors;
- The role of national industrial policy should be scrutinized regarding mobility from industry to politics and vice versa;
- There are not many natural links between these sectors. In my opinion, not all of them have to do with experiences – many are rather hobby activities or other leisure time activities, offering quality of life, and not necessarily experience industry related. Thinking in marketing terms, it is possible to see some sectors as being closer to 'mass markets', and others relating to the 'select few' connoisseurs, for instance fashion, and arts. However, it is possible to find links between groups of customers and their potential and opportunities to buy products and services;
- In Sweden, we have a high level of competence when it comes to anything to do with music, but we are very conventional when it comes to packaging experiences for tourism. However, the experience industry should involve all sectors of society, not only the ones described;
- The experience industry is a growth industry and a profile area, having a very large development potential in fields like tourism in combination with sports; security systems for all aspects of events and activities; architecture for event building; experience based learning; development of sports equipment for handicapped people; just to mention a few;
- Since we are working at integrating experiences in every facet of society, as IT engineers we are collaborating with many other disciplines – sociologists, psychologists, neurologists, artists of many varieties, musicians, film producers, chorographers, virtual architects, etc.;
- As digital media producers, we see links to specialists in the performing arts, to designers, to film production, photography, media in general, marketing communications, and learning. We are developing learning materials, edutainment, in collaboration with the faculty of dental science, and find a lot of synergies in this kind of collaboration;
- In this definition, architecture is separated from design. In many international curricula, the two are often integrated – the lines are blurred, as they are to applied arts and fine arts;
- The set of sectors is intriguing in the sense that some, like tourism and marketing communications are more of totally separate sectors, while

others are more integrated and linking, some to a greater, others to a lesser degree to others;

- There are many management and organizational challenges in making so many sectors of so disparate origins and interests collaborate and generating new synergies. Management and organizational systems are a basic necessity, but these process issues are never brought up and never paid for. Sweden should work on developing collaborative software and organizational systems so that experiences and knowledge from all kinds of tests, trials, and projects could be carefully documented for and utilized by other projects. One example of lost knowledge and wasted investment is the Media Lab subsidiary in Ireland which was closed down, all its people going different ways, and no documentation of the experiences made and no knowledge collected from the projects carried out saved;
- There are links to be developed everywhere. However, user friendliness, accessibility, and transparency must be the guiding concepts, not least so in the public sector. We are stuck in our old, existing patterns and do not see obvious links. For instance, why do I need a receipt from my daily grocery shopping? I should be able to get that information via my mobile phone or computer, should I want and need it. I would much prefer to read a poem or something equally interesting on that piece of paper. It is not difficult to find links between the sectors that can generate services – or experiences – that make my daily life much more interesting and richer, especially so if we concentrate on the interface with the user and find out what kind of services the users want and how much they are willing to pay;
- Many links exist between corporations and individuals, not so many between sectors; sector definitions are not important, the many existing links are established and maintained by individuals;
- From an international point of view, Sweden has chosen an interesting perspective in naming it "experience industry", focusing on the industry concept;

3. Are there particular needs to develop links between the sectors?

- There is an urgent need to tear down walls between disciplines;
- Thanks to the homogeneity of the country, and its general technology awareness, Sweden may become a test market for many new products and services related to the experience industry;
- The games sector is often regarded as having a large potential, but it is important to be aware of the difference between creating work opportunities and profitability;
- Links may be developed by offering experiences generated by several sectors simultaneously, as for instance tourism involving other experiences, such as spa visits, adventures in northern Sweden, etc. It is also possible

to generate links between the sectors by developing technology that can be used by several sectors;

- It is absolutely necessary to work across ALL sectors of society. We are all part of the overall society, but also parts of sectors of society, and these sectors tend to be very introvert and not leave their own small worlds – the research sector is a typical one. In such closed societies those included tend to encourage and reward each other. We have to open these closed systems and substitute old values for new ones, moving towards more cross sector collaboration. This is starting to happen; more and more researchers, bureaucrats, industrialists, politicians are seeing the opportunities, although the change process is very slow. Maybe it has to be slow in the beginning?
- In order to understand exactly what an experience is and how to develop products for experiences, technologists/engineers have to understand how perception works, for instance, and what is happening in the brain, how physiology works, how materials function, and so on. Links between the sectors are a prerequisite for the development of the industry as a whole;
- Through collaboration we can find those specific product characteristics that generate experience in its true form. Experience should be made the driving force of the development of products and services. Moreover, it is a question of refining already existing concepts;
- There must be no waterproof walls between any sectors. Cross-fertilization is the best way to develop and grow. We can easily collaborate with all of the sectors and many more; however, each sector has developed along a different road;
- Much linking is already happening, in particular so in the educational field, where students more and more tend to work with many new media;
- One interesting fact is that the experience industry connects researchers and the general public, the users, in a way that could lead to many interesting debates and discussions about technology in general and its utilization;
- There are several natural links between the different sectors, some of which are already happening, while others are lagging behind. Such natural links should be developed, and already existing links ought to be reinforced. Constantly scanning all the industry sectors – and many more – for emerging links in order to develop them should be a national concern;
- The discussion should be more about how to make experiences central in the public sector. The Social Security Insurance has to offer me security as well as integrity and easy-to-understand and transparent services whenever I need them. There are too many tautologies in the definitions;

- For links to become established we need many places to meet, we should create creative opportunities for those people who want to work across borders to meet. So far, we have not been very successful in making science and art meet, for instance;
- Collaboration is happening all the time, across many earlier fixed borders. Some think of this as chaos, creative persons thrive on it;
- The Knowledge Foundation has funded five meeting places for the experience industry in Sweden – in Rock City, Hultsfred for the music industry connected to media and tourism; in Karlshamn for experience based learning and computer games connected to media and intelligent logistics; in Hällefors for gastronomy and design; in Trollhättan for the film industry connected to media; and in Piteå, where sound, events, music, and experiences meet in 'Acusticum';

4. Do you foresee changes in the present selection of sectors for the experience industry in general? Which ones might become marginal among the sectors? Even excluded?

- In Sweden, we are not constructing houses any longer, so architecture certainly is a losing sector in the Swedish market;
- Construction in Sweden is nowadays done on a massive scale by commercial companies. There are no national projects going on, like for example the new opera house in Copenhagen, the architecture of which was decided in an international competition. So, Sweden is not offering any challenges to young architects. Thus, the country is losing competence in the field;
- In general, competence loss in several other areas is a negative trend for the country, like in mobile communications and ICT and similar state-of-the-art technologies, that once took Sweden to world leading positions, this is something that might influence the sectors of the experience technology industry in the long run;
- Design is a broad concept – for the time being it has mostly to do with fashion and animation but it will grow in many other areas;
- In a global comparison, Swedes are among the most avid media consumers – what are the implications of this for the experience industry?
- There are several very creative and highly motivated solitary players in the experience industry in Sweden – Carl Jan Erik Granquist and the Gastronomical Academy at Grythyttan; Richard Juhlin, a world leading champagne expert; Filippa K in fashion – but to what extent do they create jobs in Sweden? Where and how to find those having a hidden potential to develop experiences into a true industry?
- Those earning a lot of money in the experience industry sectors, in music and in sports, for instance – where do they invest it? In Sweden?
- Are economists involved in the experience industries?

- What do we know about the size of each sector?
- In general, it is important to consider the market as a global one: Trollywood is competing with Hollywood;
- There will always be winners and losers. At the moment, young people are driving the market, since they are the spenders. But we will see an important change generated by the older generations – those born in the 40's will be demanding a lot from the experience industry once they leave their jobs for retirement, although I do not know what they will be demanding;
- We are not good at giving our contents specialists enough to say when it comes to developing experiences. The experience developers must understand how to present, how to involve brain as well as heart in their creations, how to create a feeling of involvement. Design is also a bottleneck so far;
- Web design, in particular, is an area of great importance and should also include technologies such as the morphing of images. This could be used to help people interested in health and fitness –for instance: if you continue to eat, drink, exercise, smoke, etc. as you do now, this is what you will look like ten years, twenty years, etc. from now! If you change to a healthier diet, less alcohol and more exercise, this is what you will look like in 10 years… the technology is here;
- Generally speaking, we must become better at using bright people with ideas! Moreover, there is so much technology around that we do not yet put to work;

  Closer links between the engineering and the natural sciences are a must;
- In general, change is going on all the time. No developments, no products, no services are forever. We see changes over time and experience changes over cultures over and over again. We should learn how to handle these changes from sociologists, who study them;
- Sweden has a great tradition in design for many different purposes. We should take care to develop this tradition for the future since it has always started from the human being, from the social point of view. This is particularly important since design will mean the making or the breaking of new products as well as new services;
- We believe that the classical cultural sectors like theatre, opera, fine arts, and literature will be the losers because they are all linear. We will see and want much more interactivity, literature in which the reader participates, sort of hypertext based e-books. The highly educated specialists in these areas will disappear over time and their competence will be replaced by 'light versions', do-it-yourself technology that is easy to learn and cheap to buy. Digital photo manipulation is already here. Winners will be gambling and pornography, areas that are not quite appetizing;

- There is nothing that cannot be improved, but there is a risk that a certain area will become over exploited during a certain period of time – if sector A is seen as successful then everybody wants to work with sector A until a different sector emerges as the new 'hip' leader. We should search uniqueness in what we do, not act like copycats. There is a strong cyclic trend factor involved in the experience industry, take for instance bungee jumps – a few years ago there were bungee jumps everywhere, now they are hard to find;
- There are great changes in the way of thinking going on– industry has never wanted, much less understood individual needs. Experiences being individual are forcing industry to rethink their old paradigms – Dell and Ericsson are good examples. Certainly, they do manufacture goods, and they will continue to do so, but they make their money on experience related services. The customized demands of the experience consumer are changing the focus of traditional industry;

B. Questions Regarding Technology Enabling the Experience Industry

5. Do you see the success of the experience industry as related to one or more specific technology/technologies? If affirmative, which one/s?

- The experience industry will not succeed without information technology, hardware as well as middleware and software; communications and networking technologies, i.e. any technologies needed for mass communication are a must; standardized interfaces, the same interfaces for all kinds of computers, mobile telephones, and other artifacts;
- E-books should have a future;
- New programming languages making the Internet more accessible for the marketing of tourist services, for instance;
- It is important to decide what sectors offer the largest growth potential and invest in those;
- There is technology that stimulates some senses but not others, for instance GUI, VR, and haptic interfaces. Some games stimulate few senses, like Tetris, while more complex games stimulate more – the latter being more successful;
- Information technology, and, in the future, nano technology – the latter will be able to include smell in the overall experience packet;
- Technology has to be involved in all phases of experience – before, during and after. People will select services offering most value for money and the decision is taken based on the quality of information offered – high resolution pictures, fast fiber communications, high quality VR and 3D technology. Moreover – the consumer is mobile, thus mobile technology is vital. And it all has to be stable, easily accessible and cheap;
- Embedded security systems for outdoor activities; VR products, simulating the achievements of for instance an alpine skier like Anja Pärson

– spectators can emulate her winning a world championship as soon as she has reached the finish line; VR studios for product development; simulation technology for handling large numbers of visitors to arenas; development of experiments for the identification of the customer satisfaction level related to an experience;

- In my world, the experience industry is closely connected to mobile communications since everybody carries so much technology around – digital mobile telephones with built-in cameras, music machines, game consoles, etc. A large number of sensors, responding to different emotions and sensations are needed to generate more possibilities to express and share emotions. Gesture recognition is part of it, as is development and design of all kinds of artifacts for expressing emotions. Interface design is very important, so are haptic interfaces, signal recognition and transmission, animation, and affective loops;
- Emotion-based systems, like eMoto, a mobile service, through which the users can express their emotions through gesturing with a stylus pen, containing a number of sensors. The sensors translate the emotions into colorful, animated pictures making up the background of SMS/MMSes. There could be many applications for emotionally engaging systems and services like eMoto;
- SenToy is a system involving physical and emotional experience. It is a doll, containing a number of sensors that can be controlled through shakes and different motions. We have used it for games;
- E-cinema, a version of the people's cinema, offering high-resolution movies and sounds, where independent film producers can distribute their products. Bottom-up approaches will become dominant. Ready to use technology will be included in the artifacts;
- Learning technologies offering standardized products and technology;
- Pervasive technologies coupled to mobile technologies should be brought together – i.e. communications, sensors of many kinds, smart materials, electronic paper, all kinds of polymers. Smart materials, materials that react to temperature and light by changing qualities will revolutionize the fashion industry;
- Mobile communications developers could use hackers to find new services and products;
- Dancers are using mobile technology by integrating mobile telephones in their performances – as technology becomes smaller, cheaper, and more easy to use and understand, artists of all categories will integrate it into their works. In a way, emerging technologies is creating grass roots artistic developments that we never thought of before;
- Experience technology is the means, not the goal, to create a more transparent society where all data on an individual are used to support and help that particular individual in her/his daily life. Such technology

should create synergies between public services and commercial services for the user;

- Technology per se is not the important issue – the issue is rather the added value generated by the technology. The soft values, the ones that make life more agreeable, more user friendly, have to be added to the technology. It is important to make a difference between the values that control the technology and the technology itself. One example could be GPS positioning for the home care service – whoever is closest to the old person who has fallen and needs help urgently?
- Technology in the home care system is a big issue for discussion in the public sector – for instance, the bathroom mirrors could be used as technological carriers of data about the daily health situation of old people in need of help in their homes;
- The focus must be on the experience. We are talking about a change in our mindsets – I refuse to be a customer in a shop that does not offer an experience as well as the goods and services I intend to buy;
- The service society is based on experiences, the experience is the basic demand. The question is how we can identify the demands of users? Demands on services? In reality, we need statistics on qualities, the soft values, evaluations of attitudes and changes of people's attitudes over a number of years in order to be able to understand how we are using experiences;
- What do we expect from everything we use? Our expectations are different from yesterday's and they are changing as technologies merge and combine. For instance, now I take for granted that I can watch the TV news when going to Arlanda on the 'Arlanda Express' – in fact, I expect to do so;
- We get new information carriers, new combinations of technology, but we do not know very much of the users' level of acceptability, which in turn is closely related to the transparency and independence of the information content. Why is not all information transparent to all public service providers? Semantic interoperability is an important basic requirement to make my daily life efficient and richer. However, it is impossible to add experiences to a basic information infrastructure that is not transparent and does not work very well;
- The common ground is communication; communication as to letting the world know that we are there and that we want to be involved, but also communication between the sectors and between individuals. In general, an experience is reinforced when it can be shared with other people;
- Technology is not the issue – existing technology is so advanced that users take for granted that it will perform whatever is demanded of it, to each user's particular need;

6. Which all-encompassing technologies do you believe will be decisive to the experience industry?

- Design as a general methodology rather than a tool for developing an attractive surface. It is important to work from the surface down to the depth of a concept, involving all knowledge existing;
- VR technology plus mobile services plus heavy-duty and fast networks for linking people, for generating new communities. High quality traditional picture and sound transmissions are needed to link people to each other in real time. Virtual reality based rooms will have to be created. To a large extent, it is a matter of utilizing networks and digital technologies already here;
- Mobile communications, intelligent materials, embedded security systems. Biomechanics will be important for the development of human spare parts like knees. Smell will become a complement to museum exhibits, for instance;
- Global, mobile networks, artifacts that can convey emotions, services that involve the users emotionally and socially. Hardware, like pressure sensors and battery packages, as well as programming techniques and animations are important parts of 'emotional' services and products;
- So far, there has been a vast distance between producers and users. Now, a kind of intermediate technology is developing, such as Dreamweaver, Photoshop light versions, and similar products, which means that the user can become producer as well as consumer;
- We get ever smaller, ever cheaper, ever more clever devices, bridging earlier gaps. This kind of bridging technology makes it possible to do very many things with very little real knowledge, since the technology is included in the artifacts;
- Smart materials, emotional broadband, emotional sensors, communications, haptic networks… in 5 – 10 years from now they will mingle and integrate and pervade our lives in all of the sectors now related to the experience industry as well as the rest of society, this as a result of hard core research and intense development;
- Communication, communication, communication…
- Wireless devices for the communicating home, artifacts with portable services – I can choose among any of all my terminals which one I want to use at that particular moment. Evidently, all devices have to fulfill my esthetical as well as my functional demands;

7. From a technology point of view, what is your vision of the future of the experience industry as a whole, and what do you see ahead for the sectors?

- It is not so much a matter of the development of new technologies as the

fact that industry has to become better at using the opportunities already offered by technology;

- People seem to be demanding experiences related to reality. Sports are a good example – you are watching a lot of things happening at the same time as you are part of the audience, you want to be sitting there, participating. Some people are content to stay at home watching television, staying at the fringes, but all the same participating. In my opinion, technology offering more of the sensation of 'actually being there participating' will become ever more important via telepresence and remote techniques;
- Robotics and haptic interfaces will be part of the borderland between experience and the consumer. Smell will play an important role;
- The development of a more differentiated and customized offering of experiences in contrast to now – today we can choose between various alternatives but that is not customization. In the future we will demand real customized experiences, customized to each individual's wishes – how to develop such products and services is still an open question;
- It is a bad idea to try to merge the desktop computer into the mobile telephone. Rather, we need much more innovative products, new ones, that can enhance our experiences of the world and our communication with our fellow beings. After all, humans are group animals, and all our emotions have evolutionary causes. We are constantly sending and receiving signals about how we feel and about our reactions to what we experience to our fellow humans. This is something we have to integrate into our future artifacts for our experience based lives;
- The gap between designer and user will be narrowed – the process of generating experiences will be much closer to the user. In five years time everybody will make her/his own digital media productions, the artifacts doing much of the job. This is a parallel to the current service 'pay 1 300 SEK in order to cook a meal together with a star cook';
- Expanding the emotional sensors for all sectors is vital;
- There must be much more room for synergies between the public sector and the commercial ones. Experience should be a fundamental part of all sectors of life;
- It is a very loosely knit industry with many local and a few regional players. For some experiences, no technology is wanted or needed – nature experiences, for instance – while for other experiences VR helmets and special gloves are required. Again, the fora are important;
- More involvement of people who know their local history and who can tell the story well, making people participate and relive times long passed. A majority of the people is interested in historical experiences and these should be made as authentic as possible, and well dressed, any additions made obvious;

8. What changes within technology and infrastructure do you see as decisive for the direction of the development?

- It is not so much a matter of the development of new technologies as the fact that industry has to become better at using the possibilities already offered by technology;
- One central question is who will receive what financial support in order to develop which sectors of the experience industry; another one is what future consumers will demand;
- Information technology, culture, industry, and politics should somehow work together towards common objectives, but how do we create such networks and turn them into productive working groups?
- We need a much better understanding of what makes up an experience/ experiences. We also have to know how the involvement of the customer works, and realize that the producer cannot, and maybe should not, control the whole process of an experience. There are no self evident answers to this conundrum;
- The human being creates experiences all the time – our technology has to be able to convey these experiences so they can be shared and memorized. The technology should liberate us from desks and chairs – our bodies are very mobile, we are not made for sitting in front of a screen and a keyboard all day long. So our technology systems should be made mobile as our bodies are;
- All of society is moving ever faster as a result of technology development– we must decide if that is the kind of society we want, a fast-moving one or a slower one? How do we pick our niches?
- We are running high risks of people mixing up fact and fiction in the ever faster and ever more spectacular world – there is not enough time for reflection and analysis; Short copy lines and zapping are part of this fast world. What stance must we as designers take? How should we handle immersiveness? Will slow movements be the ones standing out? Maybe there will be special zones in the future where we cannot be connected to the networks?
- Infrastructure must become explicit, being a basic necessity for common platforms and common quality of life;
- Broadband connections to the domestic space, implying online media and in the extension the smart home, including smart textiles and emotional based technology are the bases for increasing the sense activity level including sense health appliances, biometric sensors that react to physical and mental states. For instance, a number of appliances can be connected to react to the fact that you are awake;
- Very sensitive, smart textiles change properties related to, for instance, exterior temperature, energy consumption and other similar parameters. These textiles react to heat by cooling and to cold by emitting heat. In

them, esthetics, technology and engineering are totally integrated, and also corresponding to the local culture;
- Design in general is sustainable, and embedded systems are part of our total environment in the form of embedded sensors. Among our tasks will be to find out how to make sustainable household goods, how to design for better energy utilization on a local level, how to stop the increase in energy consumption;
- We are leaving the earlier passive technology and going towards an active technology;
- The integration of existing technology embedded in our daily existence in order to make life more comfortable, less frustrating, information I need for my daily life more readily available;
- Communication, in spite of the risk of communication fatigue and information stress. The media offering today is so enormous that you have to choose. We need many filters and filter functions. Maybe we should start building antitechnology? We may well see another 'green wave' moving away from the technological society to life in the countryside of our grandparents as a result of communication fatigue. You do miss some things but there is no reason to be disappointed in all the experiences you have not had…
- Progress, and progress is painful. Those not experiencing pain and discomfort are not moving ahead, they have stagnated and will disappear, sooner or later. The experience industry is in constant movement and the movement will accelerate. Our big problem is that traditional organizations are collapsing under their own weight because they do not tolerate change;

9. Which are your most important priorities regarding technology and technology development for the experience industry?
- Branding is a very important component for the experience industry in general. A strong brand is a must for success;
- We have to consider the personal wealth of the consumers – the Swedes are not very rich and will not become heavy experience consumers, experiences will for a long time be regarded as a luxury consumption – the slow acceptance of 3G should serve as an example;
- We should combine everything we are good at and consider what may be developed with the research results and knowledge we already have. Dissemination of knowledge in the form of existing research results, and packaging of all this knowledge into new services, products, experiences, whatever, are some of the most urgent issues to engage in;
- There is a big challenge in understanding the deep implications of customization of the experience industry;

- VR studios for product development – we want to simulate how different products will function in different environments;
- Thinking about and developing design processes for emotional processes in all kinds of contexts – expressing emotions in an SMS/MMS is one example. We have developed a stylus that reacts to emotions by conveying more aggressive forms and colors as a background to the message, when the user angrily shakes and waves it, and cooler, calmer ones when the sender emulates slow movements. We are thinking about how to develop a kind of daily memory of emotions and events, including photos, that can be transferred into an 'emotional' diary, should one feel like saving those kinds of memories. Certainly there are many applications for this kind of technology;
- Long term projects that are allowed to mature, projects where standardized platforms for, for instance, e-learning are being built; in this industry, it is so easy to get involved in high risk projects that are doomed to crash once the enthusiasts leave;
- Smart materials including fiber optics, polymers, sensors, embedded communication systems based on Bluetooth technology, nano technology, the latter reducing size and replacing IT as we know it today. Biotechnology will make it possible to create biological materials in different ways. All these technologies offer opportunities to change basic industries such as the textile industry in rather drastic ways;
- Nano technology, a pervasive technology, must be developed involving people at large;
- Organizational development based on collaboration and on synergies, in the interests of the service consumers;
- There are no specific priorities except for infrastructures for communication. Also, people living and working in Stockholm should get resources to create just as well as those in the rest of the country;
- New ways of measuring attitudes and changes and user demands;
- We have reached and surpassed the top of the Maslow steps, so we are rather spoilt and demand ever more of everything;

10. What experience related technology developments do you think are the most imminent?

- It is not so much a question of new technology as a question of combining already known technologies into new products and services;
- Nano technology; virtual worlds; the Internet; digital photography;
- The interfaces needed between technology and experience;
- Technology for the handicapped making it possible for them to move securely outdoors. Embedded security systems, and IT based security systems; intelligent materials; IT systems for developing tourism;
- Virtual reality and simulation for a large number of applications;

- Development of the Bluetooth and related technologies – the protocol is too slow and too unsophisticated. The whole world is surrounded by layer upon layer of different networks – Wia-LAN, IR, GSM, GPRS, etc. – all of them invisible unless you read them through the strength of the signals in your mobile devices. Bluetooth could be a technology to give access to these networks as you move along, for instance leaving messages at the various hotspots, sharing experiences, giving advice on local services, anything that other people would want to pick up and use, and in their turn respond to virtual 'Post-Its'. We can use global networks to develop our social networks by learning how to 'read' who else is connected to a special hotspot via Bluetooth;
- Haptic systems will be of great importance;
- Everything Internet-based, from games like poker to net based social games. We see an interesting development right now – social relations are being built into new games and as soon as relations are involved young girls and women become interested in the games. Role Play Gaming is available via portable play stations and SMS/MMS. The small screens are much more user-friendly and hotspots for radio based LAN are growing by large numbers. Technology convergence is finally happening;
- Smart homes including smart technologies;
- There are many, many, many ways of developing and integrating the experience sectors. Meals may serve as an example: what does a meal mean to me? How should I eat in order to stay fit and healthy? The role of nutrition for the future of the health care system? How to make our daily meals positive experiences so that we do not overeat? Etc. The issues here are healthy lifestyles, information availability, positive experiences – and control. After all, there is so much information out there but where are the fast and easy user interfaces? How do we measure quality?
- We know to some extent how new technology is accepted by users, but we do not have answers to questions like the importance of SMS as a technology push. Where will the SMS industry take us? Push mail? Mobility? In many ways, it is a matter of finding smart applications of existing technology, often the hardware is there but we are lacking the software. RFID-chips really can change the status of goods and services, also of virtual services, and the question is to what extent they can control our virtual behavior;
- We want mobile, small, smart artifacts and television – digital television can provide a large number of services, that need to be developed, services that easily can be accessed from a number of devices, the television set, the mobile telephone, the computer… and all have to be small and cheap, and uncomplicated interfaces are the key;
- Presence production through media technology – the Royal Institute of Technology has tried it out with Stanford University in California. We

arranged a concert in collaboration, with two musicians in Stockholm and two in California and audiences of some 30 people in each place. By working hard on the scenography and the dramatic expression, we managed to create a feeling of presence for all who participated. For all communication at a distance, trust is the basic requirement, and trust creates presence. Being good at telling a story is another requirement. Transparently mediated communication is needed if people are to meet in virtual space. Such technology can be used in distance learning, and we are working on developing distance negotiations, which means that we are not working so much on technology as on other factors, such as what space is, what a room's architecture implies, the size of the people involved – how large are the virtual ones in relation to the real ones, etc. To a large extent it is a matter of definitions – we must understand each other's definitions in these contexts;

- Software and services for experiences at home – reliable broadband, the television sets working with many windows simultaneously – integration, finally, of all kinds of techniques – telephony, computer, TV, CD, video production… there is a lot of films, music and games sitting out there that I want to download now… the computer is still a one-person-device, while the TV set is the home's physical meeting point. The focus is on the user's desire for experiences;
- The food industry will change dramatically once it tries to offer more than mere nutrition, it is in for a revolution, of which we are seeing a very awkward beginning in the so called 'functional food' – who wants 'functional food'??? Surely, there are many new experience sectors to be developed in this area – just consider the wine industry! Once (in Sweden, among other countries) wine was very exclusive. Few people knew much about it. Now, thanks to all kind of media, many people have learnt about wine and appreciate and even collect good wines – the wine industry is part of the experience industry;

11. Is technology as such generating obstacles for the development of a global experience industry?

- Technology is not the bottleneck nowadays, it is rather the marketing efforts, the lack of attractive and affordable products and services, and the packaging of these;
- One obstacle is that there are very few persons who work on combining the knowledge and research results of many sectors. Another is the lack of financing going into multisector projects;
- No, but we are lacking R&D in areas like materials and structural design and sturdiness and we do not have what in the UK is called 'engineering sports design'. Bridging the gaps between engineering, science, and physiology is of great importance. Moreover, developing the necessary engineering science for local sports is a field for the future;

- No. We are able to influence the development of technology, and we have a large responsibility for the way society looks and works. Esthetics has to be part of the virtual society we are about to create, and there are many difficult ethical problems involved, which we cannot and must not avoid deciding upon;
- One of the most interesting aspects of the experience industry is how we think about the design process itself, how are we going about designing the future? How do we invent new artifacts based on the technology we have? And how do we develop new technologies? Technology is not a bottleneck, it is a challenge!
- No. Since we are all technologists, everything only grows better and better;
- Technology is not an obstacle – politics are, or rather the lack of political decisions! The national research policy is still unpublished so we do not know what way Sweden is going to chose. The country used to be leading in mobile telephony – now there is a tendency towards closing gates and becoming more domestic, more nationalistic, the international aspects being left behind. The world's leading experts once residing in the country have left or are leaving;
- In some cases there is a conviction that technology is the solution to all problems when, in reality, we should be looking at other factors. Technologists often believe that there is one exact question and one (only) exact response to that question. We need more methodology in developing multiscience – within Media Technology we work with media technology + performance + cognitive sciences + collaborative technology;
- No, obstacles are generated by obsolete thinking of industry in terms of production of hardware and products, at a time when there is a shift going on, services and experiences being the driving factor for all kind of industry sectors. We suffer from a reactive, linear thinking which does not fit in with the chaotic characteristics of the experience industry. In traditional production we know the input and are certain about the output – in the experience industry we do not know all the factors of the input and we can only guess what the output will be. There is more and more instability in the systems, so we have to learn to live with and handle chaos in order to build a successful experience industry;

C. Questions Regarding the Human Senses and Technology

12. What is the role of human senses and sensations for the experience industry?

- It is difficult to imagine an experience without senses being involved. The senses play different roles. Emotions are also involved. For instance, it is common knowledge that movies involve the audiences. But what about

eating at the world's most expensive restaurant? Or staying at the world's most expensive hotel?

- All sensations are of vital importance, but they have to involve brain as well as heart in order to entice the user to return;
- As the technology is being developed, more and more of the senses will be stimulated and involved in each experience situation;
- Evolutionary psychology has stated that there are evolutionary reasons for emotions and sensations. Shame, guilt, fear, and other emotions are there for a reason – to protect ourselves in our roles in the group and to communicate to the other members of our pack – after all, we are pack animals. So, evidently, our senses are of great importance to our survival, individually as well as a species;
- An emotion is never one-dimensional, and we are far away from understanding how the human senses interact in creating experiences;
- Smell and touch are on their way – but they should not be integrated into everything. Cinema as a medium has to stay cinema, and not be developed into some kind of smelling performance! Moreover, it is a fact that the more senses involved in an experience, the more difficult it is to erase the memories of it. We also must make clear the difference between the virtual and the real, in particular so when producing for children. We are talking a lot about this but not doing very much;
- Human senses are central to all experience, of this there is an explicit as well as an implicit awareness among researchers. In architecture, we study how different surfaces and textures ask for different behavior. Much of our behavioral patterns are based on traditions and values. In the future, multiple senses will be involved to a larger degree, for instance sound, texture, and temperature when in comes to smart materials. Design for the senses is already well developed. Communications so far are not dealing with the senses, which means there are limited channels for expressing emotions, feelings;
- It is well known that you learn better when all your senses are involved in a learning situation, so the senses are very important. It is all about how well you are able to tell a story…

13. How do sensations relate to technology? And the other way round?

- I do not know to what extent it is technically possible to reproduce the human senses artificially– is it even desirable?
- Whatever the technology development, it has to be easily accessible;
- This is a very complex question, to which I do not have an answer; maybe an answer can be found in the first question?
- Smell sensors are important but we do not yet know how users will react;
- We still do not know very much about this but we have to learn;

- We have had ideas about systems based on emotions and sensations since we got involved with the EU-project SAFIRA. We are working on developing artifacts to make systems react to and express our feelings, sensations and emotions. We have some examples – eMoto for expressing feeling via SMS/MMS; SenToy for interaction of different kinds. Sensors are of importance, of course, as are mobile communications, batteries, Bluetooth protocols, more sophisticated software for mobile telephones and digital cameras, for high resolution pictures and animations, to mention a few areas, they all relate to sensations;
- So far, the technology is the bottleneck, but once the technology is there we have to face a whole bunch of ethical problems like who will decide on what limits to set?
- Sensations will improve quality of life in many aspects;
- There must be transparency, meaning that the technology should not catch the attention of the participants;

14. How many senses, and which ones, have to be engaged in order to create experiences?

- As many senses as possible have to be involved in creating experiences;
- All senses have to be involved. But different experiences may reinforce some senses more than others – experiences may even trigger forgotten memories. A smell remembered from childhood may, for instance, make people recall long forgotten things; this fact is sometimes used to stimulate people who have lost their memories;
- All senses have to be involved. That is why inexpensive, stable, and easily accessible VR and 3D technologies along with high capacity communications are so important;
- This is an interesting research area;
- In our mobile future, all senses will be involved in our communicating with our networks – after all, human beings are the ones creating the experiences;
- The more senses involved the deeper the experiences – this in a positive sense as well as in a negative one;
- All senses are important, even if we do not yet know in what way they are important to us. Future research results will tell;
- All senses have to be involved to create experiences, but maybe it is not necessary to have all senses involved always;

15. Do you believe there may be physical and psychological risks generated by the technology development demanded by the experience industry? (E.g. self-fulfilling erroneous mental concepts, thought tunnels, escapism, dependencies, distorted reality conceptions…)

- There are risks involved in everything. Take for instance the website snyggast.se, where very young girls expose themselves in order to be judged the most beautiful by the Net community. Some men have exploited this to get sexual services from young girls in exchange for promises of modeling careers. In court, one man told of his surprise at how easy it was to get these young girls to do whatever he requested;
- Certainly. It seems to be part of being human to create new dangers and problems for oneself. Dependency is widely disseminated throughout human society, for instance, excessive alcohol consumption; computer games dependency; shopaholics, etc. We will see all of these, and more. The question is how to generate and regulate the institutional factors that may influence individual behavior;
- For physical experiences, such as sports – skiing, snowboarding, mountain biking, etc. we are working on eliminating risks of damage, but what do we know about psychological risks so far?
- In all extreme sports there are physical risks involved. We are collaborating with physiologists in order to understand what accidents may happen, what damages the equipment may cause, how to avoid them, and how to develop personal protection. In brief, risks of damages are being eliminated through product development;
- We have to find out how to identify and, if possible, eliminate real and imagined threats to each experience product;
- Developing and designing emotion based systems involve a great amount of responsibility – the integrity of the users/customers must not be abused. We have to understand and recognize the inherent risks;
- We have to decide what we want, and accept that we may have to choose between various alternatives;
- Research must be allowed to take risks, and researchers must try things out in order to find out what the risks may be since we cannot know beforehand what the risks will be. We must deal with risks as they appear, and do so by openly discussing them and finding solutions along the road;
- There are risks in the light versions of technology. We become more critical consumers of experiences when technology is enabling us to carry out so much more ourselves – for instance, thanks to light versions of CAD/CAM programs we do not have to be architects to design our own summer houses – we become our own designers, architects, film producers, photographers – the user becomes the producer – but we do not have the specialist's deep knowledge. At the same time, we are moving toward a less hierarchic society, services result in a shift in power from the earlier elite groups to the users. This in turn results in a change of values;
- I believe there are great risks of escapism – what world do you choose to

live in? The virtual one as the young persons in William Gibson's novel 'IDORU'? Or the real one? How do you choose? How do you know the difference between the real world and the virtual one?

16. How do you perceive that people's conception of reality will change as a consequence of technology developments?

- This has been discussed at length by the Committee on Technology and Society, instituted by the Royal Academy of Engineering Sciences. One conclusion is that the people working in the experience industry are not expected to be responsible for such developments;
- Everything we experience and learn influences our brain – our memory learns through our biochemical processes. Thus it is important to learn from cognitive scientists and brain researchers in order to understand these processes and their consequences better;
- In a way we are developing new languages to communicate our emotions via technological systems. For instance, we have made several studies of how people experience colors, and we have used the findings of the British choreographer Rudolf Ladan, who studied how people move in factories so that he could express the inner, spiritual experience of moving. In this context, interface design becomes very important;
- The virtual room is very flexible and ever changing – how we move in the virtual room, what we do in the virtual world will make it possible for us to amass and store our experiences, emotional ones as well as factual ones, for our diaries, for example. We can save whatever we want to relive and tie it to our social, 'real' lives. The question is what architects will be doing with virtual rooms/buildings;
- The more senses involved, the more important the changes. But in what directions?
- We know that society and behavior change slowly. Yes, we use a lot of mobile telephones today, but there are no fundamental changes in the way we lead our lives compared to 50 years ago. We have to look closely at the relations between the advantages and disadvantages of desirable changes and those we want to avoid; the relations between quality as related to quantity;
- Yes, we will see important changes, but how? Do we know how people perceive reality? A change of mindset is on its way – as consumers and specialists on our own lives, we have to help those who are there to help us, we must become good colleagues. When we are looking for information from public sources, we are doing so from our own particular life situation at that very moment. The more we use the systems the more we learn. But all interfaces must be more user friendly;
- One important question is to what extent government is disappearing and governance taking over? If this is happening we are in difficulties,

we will see chaos. Since I can do so much for myself, be my own producer of all kinds of services, my life changes rather drastically. And I become much more vulnerable…

- Do we know how people value reality? After all, it is all in the eyes of the beholder. We all act differently, we play different roles in different contexts, and we live in many parallel worlds simultaneously – work, family, friends, children… but maybe we must find out what reality really is?
- Reality perception is a key issue – the dark side of the digital world. Many people are dependent on chat services, computer games, Lunarstorm – you name it. We tend not to see those persons who spend the night in front of their computers, in the virtual world. We do not see the roles they create for themselves and we do not understand the implications of it. Yet. There are not very many books written on this theme;

17. Will the dream of the Gesamtkunstwerk, the unification of different branches of art into one single piece, engaging all the senses of the viewer, become reality? How?

- Maybe – I really have no idea. Only very few will want to 'use' it. Most people will not want to lose control of their own world;
- When working in the SAFIRA-project, we built an art installation, where we could send emotional postcards to a system. The system responded by creating music and interesting colors and forms which were shown on a wall;
- In a sense this will become possible. MATRIX, the film, is one example. But the dream of Utopia will never be completely fulfilled, since the human being will react and counter react;
- Living artists and designers work on solving all kinds of trivial problems. Today, we do not have those powerful one-man-show artists as in the past. Nowadays we are always collaborating, creating synergies, so collaborative and synergetic networks have taken the place of the past multiperforming artists;
- This may happen but it is after all a very individual experience, including presence;

D. Questions Regarding People as Consumers of Experiences

18. Do you believe people will have a better quality of life thanks to the experience industry? How?

- Some people enjoy games to a very large extent. Of course, these people experience a higher quality of life thanks to the technology. But, as in all cases, it turns into poison as soon as you over consume;
- People will obtain an increase in the quality of life through seeing, hearing, doing, experiencing things – but technology development is only a

small part, a kind of support function along the road. Technology is not the primary factor – applications are;
- When using emotion-based systems we have found that customers become deeply involved and involvement creates a sense of quality;
- For many individuals, communities and virtual worlds will add a high sense of quality of life, but the question is what will be the consequences of our living in a virtual society? How will we choose? What will we skip and what will we add?
- Yes, once we succeed in mental transportation we can make the world shrink and we can move between different places without physical transportation, without difficulties;
- We get a better quality of life thanks to the experience industry – I can live out my dreams in many ways by entering the virtual world, for instance. Thanks to the many media available, drama, art and music, once for the upper classes only, are accessible to anyone interested. But once I enter the virtual world, I have to know my way out, into the real world;

19. Do you believe that the expanding potential for active participation will be utilized – if so, how?
- Generally speaking, the market develops more slowly that the product marketers are projecting. Consumer acceptance is hard to achieve;
- The product developers will have to adapt to the users;
- Yes, but I do not know how. In general, people want to be more active sometimes, more passive at other times. There are many different personalities, moreover, the same individuals wanting different degrees of participation at different times and/or in different situations;
- Since people tend to chose whatever they believe is giving them most value for money, technology for active participation will have to help to broaden the scope of the experience. Once we know how to do this, we also know how to make the user/customer stay within a specific community. As a matter of fact, this is ultimately a question of technology;
- It may be used in product development for testing exactly which qualities of the new product the prospective user/customer finds most desirable. May be we will be able to pin down unconscious customer expectations, as well?
- We are working on finding new ways of making users giving us feedback on their interaction with a new system, so we can find out to what extent they are reacting as we have intended. We want to use such systems in our design processes;
- Thanks to communication it will be easy to create new communities and share interests and experiences between many persons, thus strengthening the experience. It will be easier to work in groups, easier to build and

maintain networks. However, should the networks become too large they will be difficult to maintain;

20. What will be demanded of the experience consumer?

- End user friendliness, that is, every artifact, every service has to become ever more easy to use for the consumer to accept and integrate it in his/her daily life. Customer satisfaction is achieved through plug-in and ready-to-use functionality;
- The consumer will not articulate his/hers demands;
- More demands of overall quality from consumers;
- The first demand will be to handle our own fears. The second to be able to handle new technology; the third to be able to choose what we want; and, finally, to be able to handle our own behavior in order to avoid dangers;
- Changes of attitudes to new – and existing – technologies and the introduction of new systems into existing communities. Jämtland (a sparsely populated community in northern Sweden) is one example of where the influence of experience technology is changing the whole society; Kiruna is another. Jämtland will become a node of knowledge for the experience industry;
- The user of emotion-based systems will have to express his/her feelings him/herself. The systems are user controlled, and may thus be manipulated. After all, we do not always express everything we feel and think – there is a lot of pretense in our interactions as human beings;
- The user can influence how technology develops by changing his/her habits – it must be remembered that a technology application is not for ever. Change prevails so the customer will have to be perceptible to changes;
- In order to create consumers, it is about developing artifacts and services that the consumer will use over a long term. Social and collective experiences are of importance, as is participation. In the US, there is the interesting example of the Amish people, who are using technology only after a collective discussion about its usefulness for the whole group. After considering mobile telephony for some time, they voted for adopting this technology and are now avid users but still keeping to their basic ways of life. Design for common sectors becomes a must;
- The basic demand is that the consumer must have some equipment for communications and knowledge of how to handle it. But really, does anybody think of her-/himself as an experience consumer???

21. What will the experience consumer demand of technology?

- The experience consumer will not demand anything at all. On the other hand, experiences are already judged by its users, and these judgments

are passed along formal and informal networks. From these judgments/critiques the consumer demands can be formalized;
- Easy accessibility, low costs, fast transmissions, high resolution digital pictures and virtual rooms, real time communications, availability in all sectors of society;
- Technology that supports all phases of the consumption of experiences, i.e., before – during – after an experience, must be consistent, of equally high quality from the beginning to the end, if the customer is to wish to stay and to come back;
- The challenge lies in an ever more advanced customization of products and services, including participation;
- It always has been up to the consumer to put forward demands – producers will not accept more responsibilities for user welfare;
- Plug and play, no manuals, one button to press and perfect function, no rules – in short, simplicity!
- User friendliness is the key to all technology, as is transparency. Users do not care how things happen, just that they happen;

22. How will/must/may virtual experiences relate to real ones?
- We have some experiences from flight simulators and reach-in technologies – what can be learnt from them?
- I have never tried so I do not know. You may want to talk to the Technology and Society group at Chalmers, they are looking at the utilization of virtual worlds;
- Our daily, 'real' lives must be integrated with our lives in the virtual worlds in order for us to experience a good quality of life. This can be achieved through high performance communications systems, for instance;
- There is a lot of work to do from an ethical point of view when it comes to making visible the differences between the real world and virtual ones;
- We have created, in collaboration with some economists of the Stockholm University, a research area looking into the tangible versus the intangible values. The music industry, banking, and the computer industry are involved. So far, we have found that there are close relations between the physical manifestations and the virtual ones – for instance, banks doing business on the Internet only are buying big, solid buildings to demonstrate their physical presence. There is collaboration between the real and the virtual – some experiences are real, others are virtual. And, interestingly enough, in spite of all information available in the virtual world, we are buying more books than ever before;

23. How will the demands for the industry's products change?
- There will be large changes, particularly when it comes to the importance

of experience based learning, and IT in schools. Object based LISP being taught via video networks is one small and primitive example;
- We must understand attractive quality as related to practical quality, just as we must become aware of the processes involved in perception and creation. The customers/users will demand full participation;
- The end users must be in total control of the systems they buy and utilize. There must be no Big Brother features involved;
- The producers have to get closer to the consumers. Today, digital photography to a large extent is controlled by consumers – what will the future look like?
- Everything will be 'more' and 'bigger' and more and more sensational, and features will come and go in cycles;

E. Questions Regarding the Experience Industry and Society

24. Generally speaking, in what ways will technology development for the experience industry influence the educational system on its basic level?

For university education?

Research?

The Swedish industry?

Exports, imports, growth, regional development?

- The problem for Sweden is that we do not have one coherent experience industry, but rather a number of entrepreneurial individuals, playing their own games;
- The Swedish experience industry, such as it is, offers a very varying quality over the country – there are no common qualities;
- An interesting parallel is the Swedish charter trip industry – Swedish tourists once constituted the very largest groups, and the most important ones, in many places over the world, but what does the development during the last few decades look like? The largest producers of charter tourism today are certainly not Swedish. We are often out there initiating new areas, but we do not continue to exploit and grow them into industries;
- One example of a successful export is the Robinson format for TV entertainment;
- Lunarstorm has become a global phenomenon – 80 per cent of Swedish youths are users – how can this product be cloned successfully?
- The quality of education is always a combination of teachers/professors and students – some want to find new ways through experiments, others want to do what they always have done. Whatever they are doing, it must be relevant to whatever it is going to be used for. Technology is no solution to education per se;

- Regarding research, technology development will be important to certain sectors, but this is expensive and only a few will see the immediate usefulness of it. Take, for instance, political sciences, if it would be possible to simulate different kinds of societies and 'live in' them in order so find out how they work, a larger version of Sim-City. And in science, to be able to simulate how a DNA molecule moves; etc;
- Regarding Swedish industry – the computer games sector will continue to grow;
- Exports, imports, growth, and regional development will continue to be unevenly distributed over the country;
- One interesting issue is how to develop the electricity grid, which provides fibers to all households in the country, fibers that could be used for communications. Can we develop simple displays that will turn the power consumption of a household into an interesting piece of art, simultaneously conveying important information? This just as one example of turning an everyday utility into a small and pleasing experience instead of a dull and ugly instrument;
- The step from producing knowledge to implementing it in products and services for real life is a gigantic and problematic one. How do we generate an innovative impact from a customer point of view?
- Sweden has a unique opportunity to develop nature-based experiences. We are convinced that the experience industry will contribute to longer tourist seasons in places like Åre by building conveyor belt ski tracks under cover, simulated world cup tracks that anybody can use, and various simulation based opportunities for winter sports in general;
- In Åre, they are building a new VR museum based on the history of the town. Smells will be included in the experience;
- For the Östersund region, there is an experience based centre planned, which is involving the cultural heritage of the whole of Norrland, including arenas for very large events. Once in use, we count on this to change the attitudes of the local inhabitants so that they see that growth and change are possible outside the traditional industries;
- Information technology is really a new medium that can be used to enhance any aspect of life;
- When it comes to e-learning, school pupils will expect teaching to be based on experience technology. The problem may become the same as when computers were introduced in schools – the teachers did not know how to handle them but the children did. The consequences?
- At university level, for a long time e-learning has been for systems and computing students, but now information technology knowledge is demanded by all institutions and institutes. The same may well become true for experience technology, which will become the new 'glue' between educational programs and users. Maybe we will see a demand for a middle-

man, a person who can tie together the producer and the user via digital technology?

- Within ten years we may well have a true multisectorial experience industry. In order to achieve this, I believe it is absolutely necessary to disseminate research results to a much larger extent than today;
- We have to enforce the triple helix model for the experience industry;
- On a regional basis, there are enormous potentials in experiences, but the manufacturing industries must understand these potentials, not least for creating new jobs, and be willing to put money into all kinds of developments, for instance in music, in film production, in games production, in e-learning. And the politicians must understand that individuals need money to buy experiences;
- For basic education, experiences will be local. For universities, we will see more and more collaboration across many borders and much common development and sharing of knowledge and resources. When it comes to research, even more collaboration and multidisciplinary work will be carried out, but the problem is to found and build functioning consortia, which is very time consuming. Where do we find the people who want to manage such projects? Regarding industry, the experience industry will support new business ideas, so they have to react and develop and build the technology needed for selling experiences. For export to happen, collaboration is as fundamental as is having good ideas and telling a good story!

25. In what ways do you believe that technology development within the experience industry will influence work life in regard to attracting qualified individuals, creating motivation, generating learning?

- The technological development will be of less importance than the experience aspects: stand-up comedians are helping selling IT-training and education; media training is very attractive;
- It will work for certain people, but these effects do not happen automatically just because the technology is there. Sufficient profit is necessary for investment to be generated, already competent employees are necessary in order to attract more attractive people, and so on;
- The corporations and organizations must know that there are educational programs related to the experience industry, then they have to learn to understand how to use them. And students must know that corporations are there and learn to understand their needs and how they, the students, can contribute. After all, in the long run it is all about communication in one form or the other;

26. Do you see that experience elements will become part of other areas but the experience industry?

- Experiences should/must/will be part of every sector of our lives, whether we are aware of it or not;
- Life could become so much richer should we be able to include 'experiences' in every facet of the daily life;
- I do hope that the experience industry will become part of our everyday lives – it cannot be left exclusively to sports and tourism;
- All industries and organizations must have experiences based on communications in the long run. So far, we have students working at Scania and the tax authorities;

27. What will succeed or expand experiences further? Individual transformation? How?

- Personal technology in the meaning that we can have more and more personalized artifacts; cultural factors will become important, so we will have to ask how cultural experiences of different groups are integrated socially and individually;
- Since decisions on what technology is offered on the market influences all, also the very marginal users, it is fundamental to understand and integrate other peoples' values, cultural ones as well as mobile ones, in order to achieve integration;
- Everyone must learn to live without constant experiences as well. Life must be boring sometimes, and we will have to learn to commute between experiences and boredom;

28. How to create a consumer demand, an end user perspective, rather than an experience industry push?

- These are in my thinking closely linked, at least in the long perspective. It is in the interest of the developer. You may develop as much as you want to, whatever you want to, but if nobody wants to pay for it, you will not be able to develop anything at all any further. Consumer related questions for the many different groups should be asked. Many of the sectors are/should be using consumer focus groups and similar networks in order to pick the best alternatives. This is very important. If you do not present all different options to consumer groups during the development phase, it very easily happens that products that nobody wants are developed. This is a well known phenomenon in marketing and product development literature;
- Several things should be done. Collaboration across any borders there are between all producers of and specialists on experiences is one. They could start by developing simple systems based on existing technology, in some cases based on the unique features of a place. Dissemination of existing research results in order to make people develop and try new things. We should create test beds for new digital services and for new

products for the tourist industry. What is the result of all knowledge generated at our institutions such as schools and hospitals? Where is the growth? We have a lot of profound knowledge that we should use by broadening and disseminating it across sectors. More research is always necessary, and now we should be concentrating on research related to the experience industry;

- Individually differentiated offerings, which demand detailed knowledge about the customers, about the experience, and about the product/service offered. This demands work across many sectors;
- The user will demand participation – how do we develop and integrate features for participation?
- An important question in this context is what positions Sweden as a nation should take from now on. A few years ago many institutions were very well integrated into the international society, participating in international projects, conferences, seminars… you name it. Of late, they all seem much more isolated and almost as having given up the international perspective for a national one. This kind of positioning will influence Swedish competitiveness;
- As soon as technology offers high quality devices at the right costs, users will participate