

H-WARE: A HUMAN CENTRED APPROACH IN SEARCH FOR FUTURE COMMUNICATION CONCEPTS

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ABSTRACT

This paper describes the human centered design approach that is used during the I-ware project (Intelligent-ware) at the Higher Institute for Integrated Product Development in Antwerp, Belgium. The objective of this 14 week student's project in the 4th year is to define innovative product applications in the field of ICT and electronics.

The I-ware 2006 edition focused on the development of future concepts in communication and human interaction: the H-ware project (Human ware).

In this approach the user – and not the technology- was taken as a starting point.

Technology is not considered to be the target but an enabling factor. Added value is defined, not by the potential of the technology but by the relevance of its application. By exploring and identifying future user's needs and expectations, new communication concepts can be developed, based on the state of the art technology.

A similar approach is followed by the industrial partner collaborating in this project: the ReNa (Residential Networked Applications) Research & Innovation Group of Alcatel, a major enterprise in communication and network technology.

Main objective of this collaboration is the search for future product ideas that support the personal and social enrichment of the user, focusing on communication, reflection and self actualization.

Four themes were presented to stimulate this creative and futuristic project:

Digital tribeware

Innovative concepts that support the communication between time and context related social communities. It provides the connections with people you share the same interest.

Fröbelspaces

Our fast changing knowledge based society requires a constant upgrading. Fröbelspaces will be environments that will challenge learning by experience and by doing. They will stimulate self activity, creativity, social engagement and motor expression.

Reflexware

Reflexware is using media for self and community reflection. It makes you think about yourself and your position within your community.

Maslow devices

Communication concepts that guide you towards a higher level of self-actualisation and make you a better human, in balance with yourself and your environment.

Keywords: User centered product innovation, smart products, interaction design

1 INTRODUCTION

In the Higher Institute of Integrated Product Development in Antwerp a 'user centered' approach has been taken to educate product designers in developing innovative products with sufficient added value for both the user and the company.

A specific methodology is followed to integrate all relevant disciplines during the early stages of the design process [1].

Students are trained to analyze the context, generate innovative product ideas and use their design ability to define feasible product concepts. Moreover, they have to be able to manage the innovation process and control all critical aspects by systematically performing interdisciplinary verifications [2].

This approach can be used for different types of products but becomes very relevant for the development of the new generation 'smart' consumer products, using electronics and advanced information and communication technologies. Because of the various knowledge fields and design disciplines involved, the quality of the output can only be guaranteed by managing all underlying design processes: interaction design, software development, electronic design and product design. A specific roadmap and toolbox is introduced during the I-ware project in order to deal with this complexity. [3]

2 THE I-WARE PROJECT

The I-ware project was introduced into the curriculum in 1999 to keep up with the rapid changes of technology. This resulted into new product profiles requiring a shift in design strategies and design methods. The 'I' in I-ware stands for 'intelligent' and indicates this shift from traditional mechanical design towards a merging of different knowledge domains needed to develop these 'smart' products. 'Ware' refers to the 'ware' in hardware or software.

Intelligent or smart products often have several 'self' functions to support their intelligence: the ability to adapt to the environment, the autonomy, the human interaction, the multi-functionality, the reactivity, the ability to react emotionally and to operate in cooperation with other products [4].

Traditional design skills no longer match the complexity of this new generation of products. If a designer wants to keep control of the final result without becoming an expert in all disciplines involved, a very specific design approach is needed.

In this fast evolving market of 'intelligent' products and systems, technology by itself is no longer the key factor for the development of innovative concepts. It is the potential of the technology, the relevance of its applications and the added value for the user that drives innovation. It is the designer's ability to explore and identify user's needs and requirements, to translate these into user's functions and user's experiences that can match these technological opportunities. The rapid technological developments and the fast changing user's expectations stress the timeframe and require a clear vision on the future. Therefore designers should be trained in imagining a desired future. They have to be sensible about changes in the way people live, work and communicate and be able to translate this into new applications that match the potential technological developments. During a 14 weeks period students have to reflect on future user's needs, to define a relevant and feasible product idea and to develop this idea into an innovative concept.

3 CHALLENGING THE FUTURE OF COMMUNICATION CONCEPTS

I-ware '06 focuses on the future, exploring the human dimensions of interaction and communication concepts. The project requires a highly creative approach and stimulates

students to gain insight in human behavior and to build up visions on how technology can influence the way we will live in the future.

This paper focuses on the methods and techniques used during the ideation of the human-centered exploration of future communication concepts. It also describes the impact of the design brief, the organization of the teams and the collaboration with industry.

3.1 Human values driving the creative process

Like in many creative processes, the setting of the scope is crucial. The design brief for this project was based on universal and timeless human values and made no reference to existing products or systems. Because of this focus on essential human needs, students were challenged to rethink and reinvent applications that support the personal and social enrichment of the user in four areas: communication, learning, reflection and self actualization.

3.1.1 Digital tribeware – Ware to support social communities

Communication is becoming more important in our society. Many new personal devices are being developed to connect us with our social network. This network is a dynamic and constantly changing context that connects various individuals. We adapt the way we communicate to the different groups. We are bound by family, work, leisure, interest, time and place. Digital tribeware is “ware” that gets you in contact with your personal community. It supports us being part of various social dynamic networks and adapts the way we communicate with people with whom we share a specific relation. The aim of this project was to develop concepts to support these personal networks.

3.1.2 Fröbelspaces – Tangible media for learning and playing

In Fröbelspaces, the impact of sensing is the key factor to improve and enrich the learning process. By merging sensorial skills and motor expression with intangible media the ‘learning by doing’ concept of Fröbel will enable user’s to interact in a direct way with media devices. Fröbelspaces are dynamic, physical environments stimulating learning through free self-activity, creativity, social participation and motor expression.

3.1.3 Reflexware – Using media for self and community reflection

Reflexware is “ware” that makes you think about yourself and the people around you. It questions and searches for your identity and personality and your relations with others: ‘What makes you who you are and what is your position within the community?’

Reflexware is a social and emotional feed back concept reflecting personal vision, attitude, behavior and inter-human relations.

3.1.4 Maslow devices – In search of self-actualization.

Maslow devices are shaping human behavior and guiding people towards the different levels of the Maslow Pyramid up to the top, thus stimulating users to satisfy ‘higher needs’. These concepts support self-respect, self-actualization and self-transcendence as a way to make the most of their abilities and to strive to be the best.

Communication that makes you a better human.

3.2 Roadmap for human centered design

The proposed roadmap aims to embed creative techniques that are commonly used in other disciplines such as web design, game design and animation into the well structured, methodological approach for developing smart products and systems.

Tools like mind mapping, persona, image boards and scenario writing are used to explore the future and to define relevant user's functions and user experiences.

These visualizations and scenarios provide a well structured description of all functions without defining the technological solutions or the functional components that are needed. As a result of this exploration, students translate the technical and user requirements into a product data flow diagram as a basis for the successive system design. A product data flow diagram (PDFD) is a graphical way of representing the data streams to and from a smart product or intelligent system. It is considered as an efficient modeling technique for translating user requirements into a technical configuration of the product or the system [4].

3.2.1 Exploring the future of communication

The description of the four topics based on human values and needs, guaranties students a lot of 'design' freedom. These universal and timeless values do not relate to existing products and make it easier for students to project their vision and ideas into the future.

At the same time the generic description forces students to explore the different aspects and dimensions of the four topics, using traditional techniques like brainstorming, mind mapping and image boards to describe the design drivers and the target groups.



Figure 1 Exploring the future user functions in communication devices in team by using brainstorming, image boards, persona, scenario writing and quick design, resulting in a transparent model of the given topics (example Fröbelspaces)

This exploration was performed in groups and resulted in transparent overviews and models of all relevant aspects and dimensions of the given topics. This resulted in a more specific and individual target for each member of the group.

The future context was explored by using scenarios. These scenarios are narrative descriptions of potential futures that focus attention on relationships between events and situations. This technique does not predict the future as such but explores its characteristics and coherence. In this particular case however the stories did not result in a coherent vision on the future but provided insight in personal relationships, trends, motivations, values and human behavior related to the given topics. This resulted in a model that can be used as a framework for the relevance of future applications. [5]

3.2.2 Defining relevant user's functions

The ideas generated during the first stage were refined and illustrated using various techniques which have proven their efficiency in web and game design. The process starts with describing user needs using the persona technique and connecting these profiles with a specific context or situation [6]. Students were stimulated to visualize these ideas and scenarios using images, sketches, quick designs and mood boards.

This provides insight in the different user aspects of the product and its relevance within a future context. Imagining a real environment, a real context and real users, support designers to clarify innovative product functions and tailor these on a human scale in a future perspective.

4 TEAMWORK AND ORGANISATION

Design projects become more difficult to manage and realize if the timescale is stretched and the solution area is broadened. Thinking in the future leads to more uncertainties on both technological and human related aspects. Dealing with these unknown factors in an educational environment requires a specific organization of the project. The concept of design studios was used as a metaphor to balance individual skills and group dynamics. In a virtual design studio a group of 6 students explores the future context, describes the model of the given topics and searches for innovative opportunities in human communication concepts. This allows the use of creative group techniques and enhances the variation, the in depth knowledge and the relevance of the output. Each group establishes its style and identity to support the teambuilding.

The future scenarios, the mood boards and the generated model are the result of the collaboration. The group also functions as a reflecting panel for the individual described persona and user scenarios. After discussing, evaluating and selecting the product ideas, the development of the system design into product concepts becomes an individual challenge.



Figure 2 'Musicube', is a device that teaches people how to play guitar in a playful way. The wireless glove provides visual and tactile feed back (Fröbelspaces). The "PartyBracelet" is used in discos to support the communication between members of related groups and the interaction with lighting and music (Tribeware).

Furthermore, the collaboration with an industrial group and its contributions were one of the key factors for the quality of the design process and of the final results.

The ReNa research group from Alcatel-Lucent specializes in REsidential Networking Applications. The main focus is not the technology on itself but the user functions it can provide. Their expertise in this human centered approach in combination with their technological know-how in communication devices was agreed to be an efficient added

value to the project as a whole. They contributed during definition and preparation of the project scope and provided feed back at the decisive milestones. Merging the educational and industrial background resulted in a win-win situation.

5 CONCLUDING REMARKS

The challenging and abstract format of the design brief and its focus on human needs and universal values provided students with an open and unlimited design space with no references to existing products. It supports the human centered approach and leads to more innovative, futuristic concepts.

Exploring and describing the future requires a more structured and methodological approach. Building coherent, more reliable estimations of our future world requires a more rigid step-by-step procedure as described in the Participatory Methods Toolkit [5]. This is already successfully established in the successive I-ware projects at our institute. Scenarios that explore the user aspects of innovative concepts result into more relevant and better defined applications. These scenarios emphasize the intangibles, the user experience and the added value of the new communication devices. It also provides a more solid and comprehensive basis for the Product Data Flow Diagram as an translator between required user functions and the technological solutions of the device and its interaction with the user. This approach stimulates students to rethink the way we will communicate with smart products, intelligent systems and environments in the future.

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