Gaining insight into unfamiliar contexts: a design toolbox as input for using role-play techniques

J. Rodríguez, J.C. Diehl, H. Christiaans

[a] *Faculty of Industrial Design Engineering. Delft University of Technology. Landbergstraat 15, 2628 CE Delft, the Netherlands. dfs@tudelft.nl Tel +31(0)614015469/Fax +31.15.2782956*

Abstract

This paper presents a design toolbox developed for Philips Design in commission of Philips Medical Systems that provides insight into the healthcare context of rural India. Creating products for this context requires an understanding of the needs of the people within it. This paper discusses 'contextual design' through the combination of different descriptive and experiential tools, used to introduce designers into a context they are not familiar with. The toolbox has been evaluated using different performance techniques with design students. The use of role play techniques has proven increasing relevance in many aspects: increasing the understanding and experience of participants about the context, creating an embodied and common understanding of the ideas being developed and communicating the concepts in their context.

Keywords: performance, cultural diversity, design tool, context information, people understanding

1. Introduction

Philips has currently begun working on long term plans for sustainable business. Inspired by the work of Prahalad (2004), the company wants to explore products, technologies and business models available to those at the Base of the (economic) Pyramid (BoP). The BoP concept, also known as B24B (business-to-4-billion), was introduced by Prahalad & Stuart (2002). They made the observation that 4 billion people remain outside of the global market system. The BoP concept frames this stunning fact as both a tremendous need and real opportunity for corporations. The BoP represents a vast, unexploited marketplace. For companies struggling with maturing markets, floundering business models, and serious questions about who their customers of the future will be, these are important markets to crack. But tapping into these overlooked markets will require companies to reconfigure their business assumptions, models, and practices (Boyer, 2003).

The aim is to develop sustainable business that helps provide better health(care) solutions for the world's poorest people while also providing access to this potential market of 4 billion customers worldwide and thus creating profitable business for the company.

1.1. Need to understand people and culture

Creating products for such emerging markets requires the understanding of the needs and context of the people within it. A new way of 'contextual design' (Beyer & Holzblatt, 1998, and Iacucci & Kuutti, 2002), introduced in the area of HCI, is becoming more and more popular also among product designers. Studies carried out by Russo and Boor (1993) and Zahedi et al (2001), demonstrated that users show

resistance to and reject products with western metaphors in favour of products localised according to their own culture. Anthropologists like Hofstede (1991), Trompenaars (1993) and Hannerz (1992) have studied some cultures thoroughly and published classic theories on this topic but these works are not used and applicable for the design domain (Marcus and Gould, 2001).

In this situation it is clear that researchers and designers should engage with the cultures directly in order to better understand local people. Culture and user driven innovation is even more important in contexts where cultural differences are big compared to developed countries. Therefore, understanding people's needs and interaction with the material world is a basic starting point for successful product innovation.

Several research methods have been developed in order to understand people in their original contexts. Ethnographic research has shown increasing interest in business innovation processes by identifying how people interact with products, environments and services (Leonard and Rayport, 1997). Design research techniques have evolved from uncovering what people do and say to what people make (Sanders, 2000). New techniques such as cultural probes (Gaver et al, 2005) can introduce the end-user into the design process by co-design and get deeper information than the common focus groups or observational research methods. Many tools have been developed focused on facilitating this qualitative data gathering and organization. The Illinois Institute of Design, for example, is developing a sharable database called "User Insight Tool" for doing faster and deeper activity-centred research (Kumar, 2004). Executing the kind of qualitative research as is mentioned here is expensive and time-consuming, reason why researchers are looking for alternatives.

1.2. Use of performance techniques

The use of performance techniques has demonstrated its value into experiencing context information within the design process (Burns et al, 1993). Different groups of research and design professionals at Computer, Xerox Parc, Interval Research have been active in the practice of such processes (Buchenau and Suri, 2000). Companies like IDEO claim the use of role-play as a vital tool in every design stage for working with clients and users. Oulasvirta et al. (2003) describe that techniques such as "bodystorming" build upon ethnographic fieldwork data. But in order to gain useful insight by designers and use this information in an efficient way, this data has to be translated and introduced into the design process and role-play activities. Many scholars and practitioners have discussed the use of different individual tools for a specific field of understanding the context. Personas, scenarios, mood-boards, storyboards, pictures, videos, narratives etcetera have shown their own specific use within this field.

However, little explanation exists about the use of such performance techniques that are focused on getting insight into contexts that are unknown for designers. Furthermore, little is explained in literature about which kind of tools can facilitate such performing activities. Therefore the following research question has been defined for this study:

Which kind of tools can be used in order to gain insight into unfamiliar (cultural) contexts for designers?

Indian rural healthcare is taken as a case study for the research because of its practical value for Philips.

2. Toolbox

In order to answer the research question the information needs of designers when designing for unfamiliar contexts have been analysed. The results of this analysis have been used for building the structure of the toolbox. This will be described in the next sections together with the development and evaluation of the toolbox.

2.1. Toolbox users

In order to define the requirements of the tool, the future user needs and usage scenarios are identified. Four target groups of the toolbox have been defined: students, professional designers, technical developers and management (see Figure 1). Each target group has different personal goals and information needs and each of them will use the tool in different situations. A description of these characteristics has been the starting point of the program of requirements of the toolbox.

Fig.1 Different toolbox users

2.2. Information needs

A thorough analysis of the information needs when designing for unfamiliar contexts has been conducted by personal interviews with designers and researchers with experience in emerging countries within Philips Design and Delft University of Technology. The information needs discovered led to the requirements of the toolbox and create a structure among all the different tools. This analysis has shown that western designers need both descriptive as well as experiential information in order to gain insight into unfamiliar contexts such as rural India. A common design process for such emerging markets requires personal contact with the distant culture which is normally experienced by living there for a while. Designers encounter complex situations which they were not able to understand by common reading material. Therefore insight is described as the deep understanding of a complex situation by a combination of understanding the representation and experiencing the context. In the case of this toolbox, the goal is to combine these two information types and create the experience by substituting direct participation.

2.3. Toolbox structure

The toolbox is divided into 5 different clusters of tools that give a stepwise understanding of the context and are used for different purposes. These tools simulate the process of gaining insight as was

discovered in the interviews with the designers. Main distinction within the toolbox is that between descriptive and experiential information, which were detected as key elements in the process. Figure 2 describes the basic structure of the toolbox.

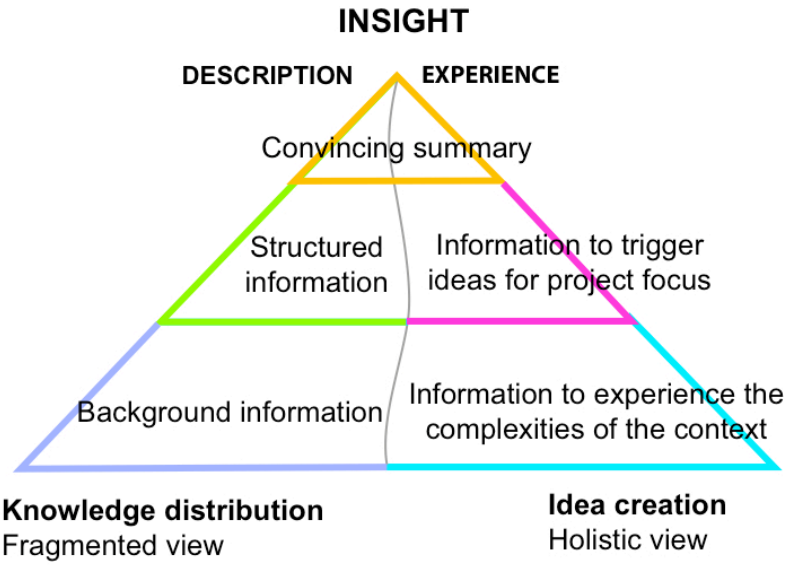

Fig. 2 Toolbox structure

2.4. Tools

The tools developed are described following their sequence of use during a common design process.

2.4.1. Summary tool

A slide show presentation has been developed in order to give a first introduction to the context. This presentation shows some visual material that is used as “food for thought” in order to prepare and open up users for further assimilation of information.

The introduction to Indian rural healthcare has been developed using an automated slide-show that combines inspirational pictures with *infographics.* Infographics are visual presentations through which information is presented in an illustrative way combining diagrams, pictograms etc. The presentation was accompanied by background music that follows the rhythm of the slideshow.

2.4.2. Structured information tool

The structured information tool shows the context of Indian rural healthcare and contains all the basic information needed in the opportunity identification stage. A booklet has been developed with four basic topics: general information of India, social context of health, healthcare stakeholders and infrastructure and health issues. These topics are approached combining descriptive text with quotes, pictures and diagrams in order to increase the understanding of the topic.

The content of this tool was a combination of Philips Design internal research material, reports of student projects, literature and internet sources. The infographics covered information about India compared with some Western regions: Europe, US and Netherlands (which were seen as main reference for the toolbox users). The information included the social context of health (local attitude), the healthcare infrastructure and the stakeholders in the primary healthcare, and statistics from World Health Organization.

2.4.3. Background information tool

The background information tool allows for the location of information of Indian rural healthcare and for

going deep into some topics in a fast and easy way. In order to achieve this, a website was developed containing all the digital content about Indian rural healthcare.

Because of the importance of the interaction between people in the process of getting insight, new features have been added to the website that increase this interaction. A mailing list can be used in order to inform others of some new or interesting information found in the website. A "web log" or message post can be used, where users can leave their comments about related topics.

2.4.4. Experience tools

Due to the complexity of getting experiential information, several different tools have been developed to achieve this goal. These different tools have been used as input for different role-play techniques offered together by way of a workshop.

Personas

Persona tools were used in order to engage participants with characters based on real-life stories. Personas are used for identifying and understanding people's needs and values in the context of a particular activity (Bueno et al, 2003). Using such tool allows designers to develop solutions based on real life data which is more realistic and more appropriate to the context they are designing for. During the test workshop each participant took the role of one persona and this tool was used in order to brief them about their role. Three different personas have been developed for the test of the toolbox, one patient, a mother, and two healthcare providers, a doctor and a female healthcare worker. In Figure 3 an example is presented.

Fig. 3 A persona

The information provided in the personas focuses on the daily activities both for the healthcare providers as well as patient. As to the mother, because of her importance as icon of the family, extensive information of the family composition was added. For the healthcare worker the social skills, her relationship with others, were stressed. The doctor persona emphasizes the way of interacting with patients which has been detected as key information of his role.

Video personas

In order to increase the experiential information about the characters, short movies (of about 3

minutes) have been developed showing the daily activities of the personas. During a workshop at Philips Design it was observed that paper based personas didn't provide enough information to fully understand and experience the personas and their context. Furthermore, if the personas have to be role-played, richer information about body-language, gesture etc. has to be provided to the participants. These videos introduce the characters with richer information about their context.

Scenarios

In order to understand common healthcare issues in rural India different situations have been contextualized into scenarios. The scenarios explain the interaction between the personas and place some of the problems in context. Three different scenarios have been developed (one for each persona) with each of the topics (see the example in Figure 4). In this way each character understands and experiences a problem from a different viewpoint. The scenarios have been developed combining a narrative text of the actions with pictures. This format has been selected in order to give participants the freedom to imagine and embody the happenings of the scenario.

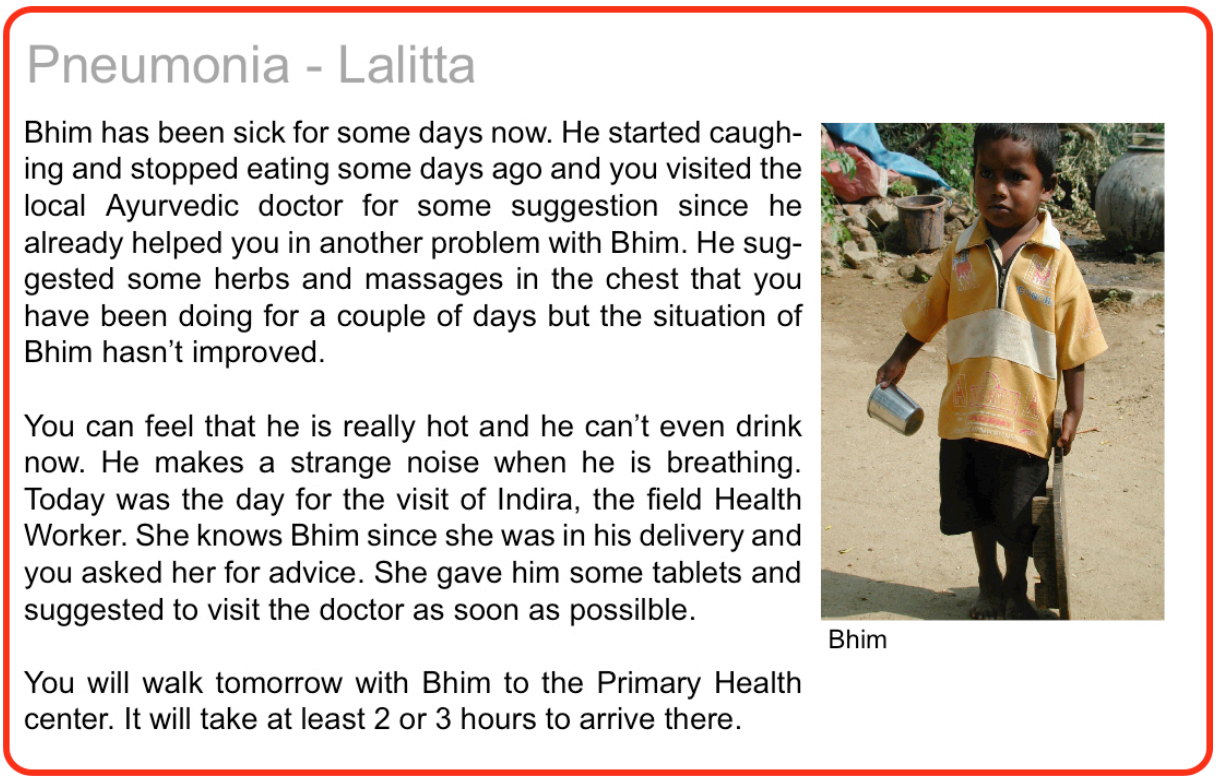

Fig 4. A scenario (for the persona in Figure 3)

For the toolbox test, four different scenarios have been selected and contextualized: Pneumonia, Diabetes, Oral Cancer and Malaria scenarios have been developed. They were selected on the basis of their significance for the Indian context and their representativeness regarding healthcare problems (access to healthcare, emergency cases, prevention cases and so on).

Role-play variants

Different role-play variants and definitions can be found in literature depending on the function and design stage in which they are used (Burns et al, 1994; Iacucci & Kuutti, 2002; Simsarian, 2003). Role playing has been recognized as "*the practice of group physical and spatial pretend where individuals deliberately assume a character role in a constructed scene"* (Simsarian, 2003). In this paper role-play is defined as the first performance developed by participants based upon the personas and scenarios given.Another variant of role-playing that is widely recognized in literature is "bodystorming" (Burns et al, 1995). "Bodystorming" was used during the experience workshop to develop the ideas and create physical scenarios.

"*Unlike brainstorming, bodystorming is the transformation of abstract ideas and concepts into physical experiences. Fun and tactile, this approach allows us to investigate different qualities that an idea may have when applied in a physical setting. It enables rapid iteration and development of ideas and relationships through a dynamic, continuous and creative process of trial and error".* (Lane, 2003)

The last type of role-play used in the workshop was "informance". "Informance" is explained in literature: *"We have been developing a visualization technique that we call Informance Design. We render scenarios as plays and interactive environments. Designer "actors" role-play as users with simple prototypes employed as "props". These performances open up informed dialogues between designers and an audience, to further explore the design issues raised.* (Simsarian, 2003). These different role-play variants were used in a workshop in order to experience the context, develop and communicate the ideas respectively.

2.4.5. Idea Generation tools

Having experienced the context, the inspiration for creativity primarily emerges from the design problems; designers can be seen as creative problem solvers. In the case of healthcare, the problems are basically focused in health issues. The idea generation tools should encourage creativity and help participants generate new solutions for Indian rural healthcare. In order to generate these ideas, two different card sets have been developed: the red health issue cards and the green solution cards. See examples in Figure 5.

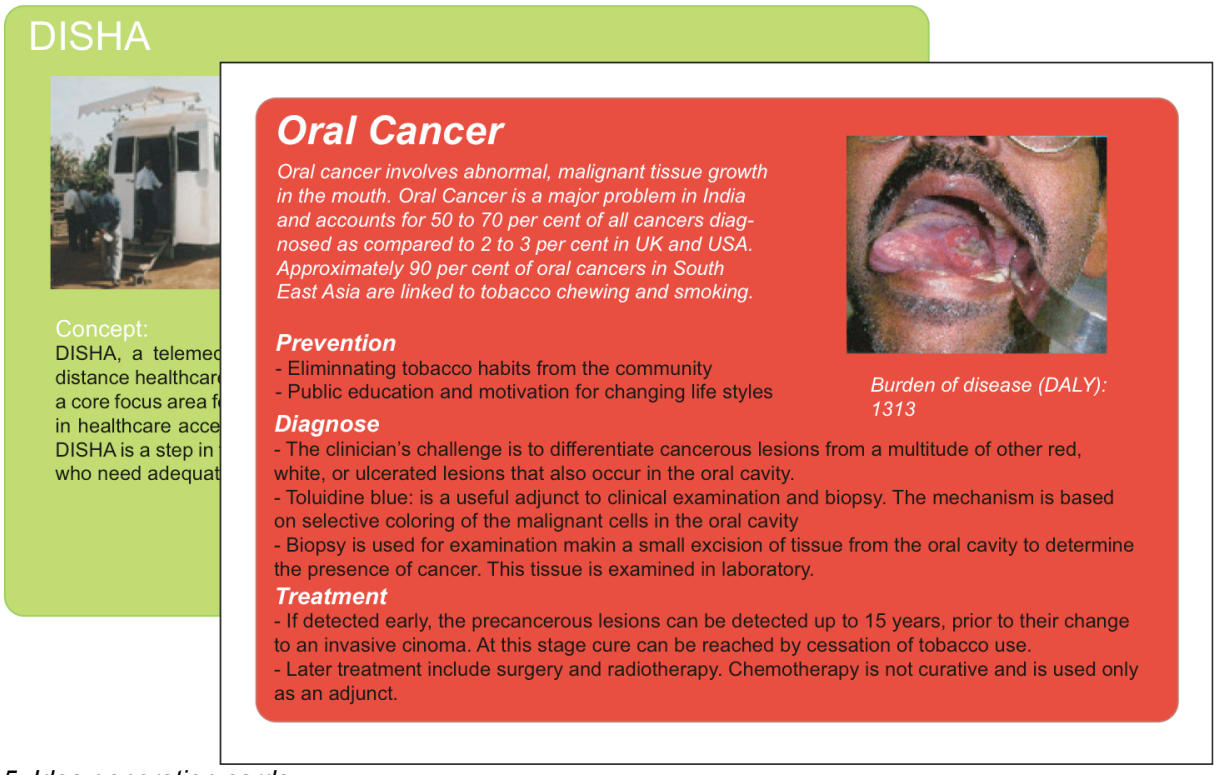

Fig 5. Idea generation cards

The red health issue cards give a short summary of the origin, diagnosis and cure of the most important health issues selected of rural India. In addition to this, some graphical information has been added in order to facilitate the understanding of the health issues. The green cards present the solutions being developed by Philips for the context of Indian rural healthcare. They describe the problem tackled by the concept, the idea behind the product and the stakeholders involved. These cards are used to inspire designers with solutions that are similar to the ones being developed in the workshop.

3. Evaluation toolbox

In order to test and validate the toolbox a common use of the toolbox within the product development process has been simulated.

3.1. Participants

In order to better understand the future users of the toolbox, as explained in §2.1, four potential target groups have been defined: Managers, Industrial Designers, Researchers and Graduate IDE Students. For each target group a user profile by means of personas and a user scenario of the toolbox has been developed. Since each target group has different personal goals, background and professional context, each will interact with the toolbox in their own idiosyncratic way.

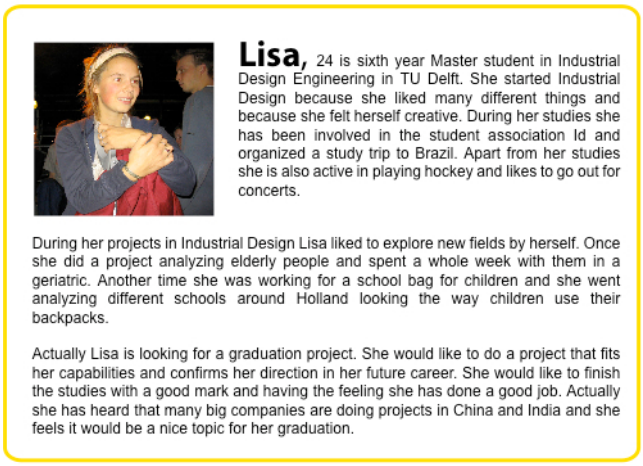

Fig. 6 Target group for the test: Graduate IDE Students

The toolbox has been tested for one of the four target groups: Graduate IDE Students (see Figure 6). Five master students have been selected which were in the position to start up their final year project with regard to the Base of Pyramid kind of projects for Western organizations. They were in a real situation of the potential future users. The students were form different nationalities, Dutch, American and Taiwanese. None of them had any specific experience with Indian rural healthcare.

At the end of the two days workshop each participant provided a written evaluation. In addition they were individually interviewed afterwards.

The final outcomes of the workshop were presented by role-play to a panel of experts of representatives of different Philips department (a senior consultant of Philips Design, a senior researcher Philips Natlab and a senior product manager of Philips Medical Systems).

3.2. Procedure

The tools' sequence shown in Figure 7 describes the usage of the toolbox within a common project for design students, which is taken as basic procedure for the test because it encompasses a complete use of the toolbox. The summary tool is used first. This summary tool should give introductory insight in the complexities of the context. After the summary, the structured information tool and the background information tool are provided to participants. The first should give a descriptive understanding of the context. The toolbox users could get some deeper and specific information from the background information tool. This combination of tools was provided a week in advance to the test participants.

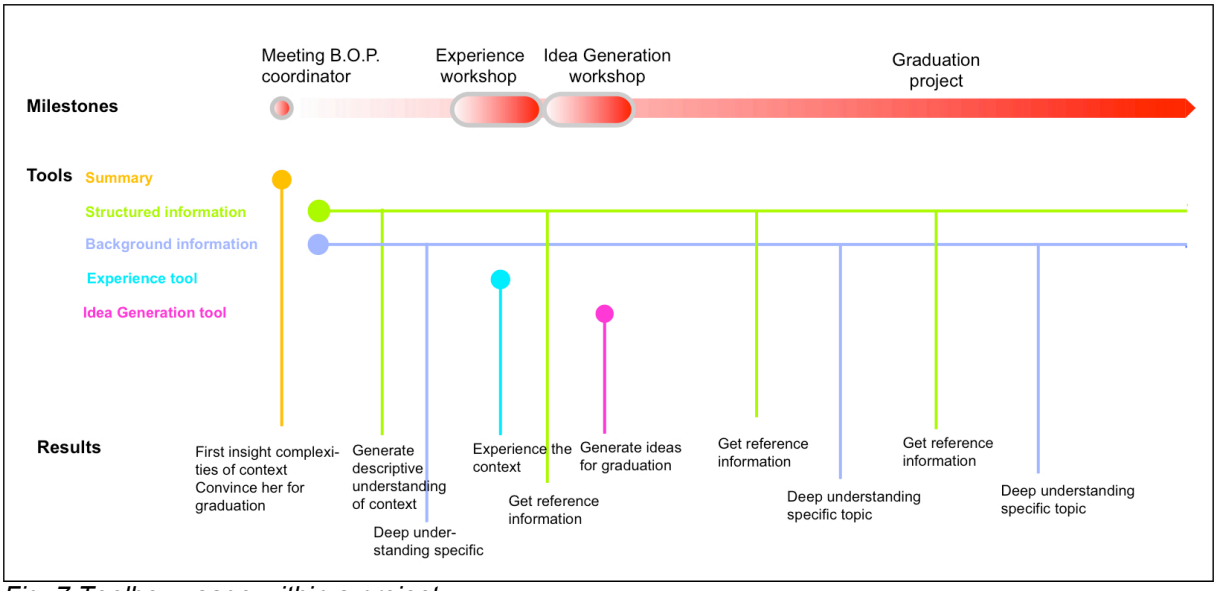

Fig. 7 Toolbox usage within a project

After providing introductory tools participants were gathered for a 2 days workshop in Philips Design. The experience workshop was tested during these days. Figure 8 presents the main steps of this workshop and the tools used in it. Apart from the tools mentioned before, Indian rural food was provided to the participants. This food aimed at experiencing smell and taste of rural India as well as some eating habits of the context. The food provided went from the most basic rural food towards more sophisticated dishes during the course of the workshop. In addition to this, Indian dress and accessories were given to the participants in order to develop more vivid role-play activities.

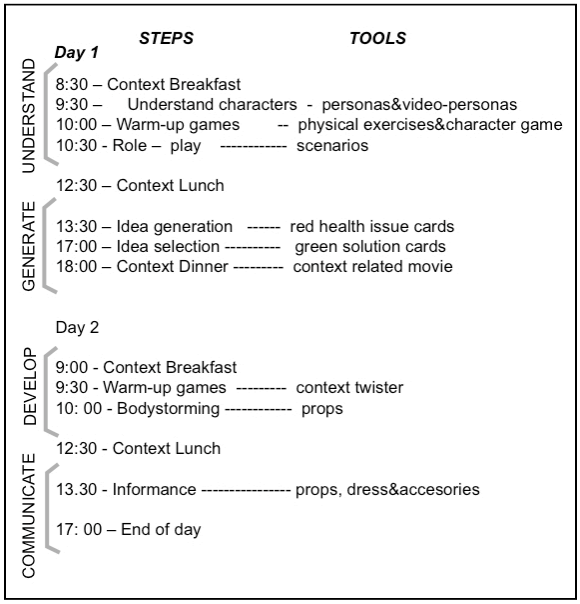

Fig. 8 Outline of experience workshop

3.2.1. Warming-up games

Several exercises were performed that were useful to warm up both physically and psychologically for the role-playing. Three different games were used: physical exercises, “character game” and “context twister”. These different exercises were developed before the role-play activities started.

Figure 9 shows the physical exercises. These exercises can be performed by putting the participants in a circle together with the facilitator. The facilitator gives instructions about the exercise to be done and

the participants imitate him/her.

Fig. 9 Physical warming up exercises

The character game is an exercise that helps understanding and remembering some of the characteristics of each of the persona in a playful way. Participants are put in a circle and one of them stays in the middle. The participant in the middle points to any of the other participants randomly shouting the name of one of the personas presented before. Both participants besides him/her have to make a characteristic gesture of the described persona (Figure 10).

Fig. 10 Participant performing a characteristic gesture of a persona

The “context twister” game helps warming up physically as well as starting physical interaction. In addition to that, it introduces the participants to the states and geography of India. This game consists of a big map of India with its different states and a board with the same states on it. The states on the board are linked either to the left/right-foot/hand (Figure 11). The facilitator turns the pointer in the board and asks to the participants to put one of their hands or feet on the corresponding state. The game continues till the participants fall.

Fig. 11 Context twister in use

The different steps of the workshop have been divided in 4 main clusters concerning understand, generate, develop and communicate. The different tools presented in the toolbox were integrated during this workshop in order to support these different steps.

3.2.2. Understand

The first performance variant used was role-play. Role-play was used for understanding the situations and engaging the participants with the context. In order to perform this first role-play each participant selected one persona and saw the video-persona. After seeing the video-personas each participant took one scenario that explained the situations in their context. Figure 12 shows a situation. The participants role-played each scenario and discussion followed afterwards on the problems that were detected.

Fig. 12 Role-play in action

3.2.3. Generate

In order to generate ideas based on the problems detected in the first role-play, the scenarios were put

on a flip-over and a brainstorming session was held based upon the detected issues. The red health issue cards were provided first in order to clarify the health issues, the green cards were used to inspire designers with Philips proposed solutions (Figure 13).

Fig. 13 Idea generation in progress

3.2.4. Develop

The ideas generated in the brainstorming were clustered and selected for “bodystorming”. In order to develop these “bodystorming” different mock-ups were developed and participants generated whole new scenarios with the new ideas integrated into them (Figure 14). The scenarios were improvised till a common agreement was reached and understood.

Fig. 14 Bodystorming with mock up

3.2.5. Communicate

Once the ideas were developed into a scenario they were presented to a multidisciplinary audience of professionals from design, research and business coming from Philips Design, Philips Medical Systems

and Philips Research using “informance”.

3.3. Evaluation

The analysis and evaluation of the toolbox has been the result of different observations made among the two target groups: (1) the participants in the workshop and (2) the professionals from Philips. At the end of the two days workshop each participant provided a written evaluation. In addition they were individually interviewed. Finally, an open discussion with all participants was held. The experts we also asked to evaluate the total product use scenario. Additionally, a few weeks later they were individually interviewed as a reflection on the approach. The oral data of both groups were transcribed.

A qualitative analysis was performed by two researchers. They independently categorized the data. Next, the findings were compared and final conclusions were drawn.

The findings and conclusions of the toolbox test are now described following the same tool sequence described before. Some of the comments of the participants are quoted for better understanding of their reactions.

3.3.1. Evaluation summary tool

The presentation gave a first feeling about the context of Indian rural healthcare even if it stays at a first superficial level. *“If the goal of the presentation was to provide us with a feeling of the Indian rural healthcare then it was interesting. It was a good teaser and introduction. I was impressed.”* The slide-show works as an eye opener and prepares participants for getting more information.

3.3.2. Evaluation structured information tool

The evaluation of the booklet given by the participants is positive and the booklet does serve as reference information. *“It is very good as reference book of Indian rural healthcare. It is a book with comprehensive information about it”.*

During the workshop participants made use of the booklet while the persona was read (information reception). Comments were made that proved the knowledge about the booklet: *“You said in the booklet that Dai’s were paid some Rupees for their education…”* The main comment for the improvement of the booklet is on the addition of more graphic information like pictures or diagrams.

3.3.3. Evaluation background information tool

Most of the participants didn’t use the website prior to the workshop. The ones that used it did it only once and didn’t look into details. Some of the reasons for this could be that participants don’t have the need to go deep into certain topic prior to the workshop. Another one could be the difficulty to access Internet compared to a booklet, which can be read everywhere. This tool could be more useful later on after the workshop is finished and participants have chosen the focus of their project.

3.3.4. Evaluation experience tools

The reactions towards the personas were different depending on the character. It is interesting to observe that since the first 5 minutes after giving the personas the participants were talking already in first person, which shows some kind of engagement with the persona already. “*How much do I get paid? Do I get paid during my training?”* The participant that worked individually with the persona got engaged with their character more than the others. *“She has become really Indira, she is even more social now!”* During the evaluation participants commented that the personas were useful to understand their job scope and personalities.

The video personas were referred constantly during the role-play session as well as the idea generation steps. When discussing openly about the tools these videos were seen as one of the key tool during the workshop. The videos show the characters they have to play in context, which gives richer information than on paper. Especially for the role-playing body language, sounds, surrounding environment etc. are really important.

The scenarios confronted the participants with real problems and situations that the personas encounter in rural India. “*It was an introduction to the issues we were confronting contextualized”.* The scenarios are even stronger when combined with the role-playing “*When I only looked at the scenarios, it’s*

still quite fuzzy. However, after the role play and the discussions, I realized the situations and the problems much better than the very beginning". Participants also suggested the scenarios as one of the key tools they would select if the workshop would be repeated.

The role-playing was the part where the participants were really confronted and asked to experience the scenarios presented. This part of the workshop was perceived as the most important in the workshop "*I must say it's the most important and useful part in this workshop"* They had to actually act as if they were the character and this step made explicit the understanding each participant had about his/her persona. Participants learned both playing as well as observing the role-playing. The comments of other participants to the role-play gave a different perspective to the person who was playing. "*I liked watching more than participating because I learned more. People commented more on what they saw you doing than you were able to see of yourself. They could make conclusions about what they saw you doing which may have been different than what you thought you were doing."* After the role-playing rich discussions about the behaviour of people and understanding of them was created. *"I was wondering how emotional those people are, when I was playing I could have said she is dead but how do they perceive death?"*.

The "bodystorming" was insightful when developing ideas and creating a common understanding of them. During the brainstorming session ideas where described in paper and post-it notes. Once the ideas were written on the flip-over they were "bodystormed" and this activity created a first agreement on what the concept was at that stage and new questions raised about the it that were not thought before.

But the strength of the different role-play variants was not only in the experience of the participants and embodiment of the ideas but also in the power to communicate the ideas created during the workshop. The presentation of a whole scenario via "informance" instead of a product drawing allowed a deep interaction with the audience (Philips Design, Philips Medical Systems and Philips Research representatives) about actual behaviour and values of people and not only about design features of the product. The audience was able to understand the concepts with a broad understanding of the context characteristics that were thought on them. The role-play proved to be a strong tool for communicating the outcomes of the workshop to the experts in the panel.

3.3.5. Evaluation idea generation tools

Participants used the idea generation cards randomly during the creative session. The red cads were used first to have more information about the diseases they were working on. They were perceived as more useful than the explanations on the booklet about the health issues. *"They are much more readable and useful than the booklet. In the booklet the descriptions of disease are only/mainly in texts, and not so easy to read".* When some ideas were generated that were similar to the ones Philips has developed participants read the green cards.

3.4. Participants and facilitators

Practicing and managing a role-play session was seen as a critical step both for facilitators and participants who didn't have previous experience with these kind of activities. Therefore, the assistance of a role-play facilitator was requested for the development of the performance session.

The detected advantages of having a role-play facilitator were:

1 – Created trust within the participants

The fact that the role-play facilitator had background in theatre created a more secure space for experimentation and participants accepted and trusted the instructions given to them.

2 – Commented on the performance of participants

During the different performing exercises the role-play facilitator made sharp comments on the way participants where performing and gave interesting tips on how to improve the exercises.

4. Conclusions

The toolbox test showed that for designers gaining insight into unfamiliar contexts is a process of

getting information and interacting with each other to bring this information to a higher intellectual level. In order to support this process it is necessary to use several tools rather than a unique tool that provide different input information. These tools should combine both descriptive information as well as experiential information and they should facilitate a rich interaction between different users.

The test also showed that the use of vivid information like video personas enhances the experience of the participants with the context and that these videos are even more important when participants need to role-play because they provide rich information about sound, body language, gesture etc.

In general, the results are very promising. Putting designers in the roles of the people and context they are designing for is an effective method to increase the engagement of the designers with the users. This was made possible by using different role-play techniques which has shown to have increasing relevance for understanding the context, developing the ideas and communicating the concepts in their context. We are aware of the problems connected to the way contextual design has been filled in with the toolbox (see also Iacucci & Kuutti, 2002). It isn't a panacea for making all tacit knowledge explicit, nor can the experience generated by working with the toolbox substitute direct contact with the culture and the people within the real context. However, the tools used here offer designers another way of looking at and experiencing the context, which lead to an enrichment of their personal and shared knowledge base.

Acknowledgements

This project is carried out in collaboration and supportive expertise of Philips Design, Eindhoven (NL) with the supervision of Liesbeth Scholten. The source materials of the tools presented in this paper are based on field-work research projects from Philips Design, TU Delft and TU Eindhoven. The project is commissioned by Philips Medical Systems and is carried out in the context of the Master thesis of the faculty of Industrial Design Engineering at Delft University of Technology.

References

Beyer, H., & Holzblatt, K. (1998). Contextual Design: Defining Customer-Centered Systems. San Francisco: Morgan Kaufman.

Boyer, N. (2003). The Base of the Pyramid (BOP): Perceiving Business from the Bottom Up. Global Business Network. http://www.gbn.com/ArticleDisplayServlet.srv?aid=6500

Buchenau M., & Suri J.F. (2000). *Experience Prototyping*. In Conference on Designing Interactive Systems: processes, practices, methods, and techniques (DIS2000), New York, New York, 2000, ACM Press, 424-433.

Bueno M., Rameckers L., Lindsay C., & Scholten L. (2003). Pulse Guidelines: Translating Research Results Using Personas, Eindhoven: Philips Design, internal report..

Burns C., Dishman, E., Verplank W., & Lassiter B. (1994). *Actors, Hairdos & Videotape - Informance Design*. Using performance techniques in multi-disciplinary observation based design. In Proceedings of CHI'94, Boston, ACM Press, pp. 119-120.

Burns, C., Dishman E., Johnson, B., & Verplank B. (1995). ''Informance'': min(d)ing future contexts for scenario-based interaction design, BayCHI, Palo Alto, CA, 1995. (Abstract available at http://www.baychi.org/meetings/archive/0895.html)

Gaver W., Boucher A.,Pennington S., & Walker B. (2005). Cultural Probes and The Values of Uncertainty, *Interaction, 11* (5), 53-56.

Hannerz U. (1992). Cultural Complexity; *Studies in the social organization of meaning*. New York: Columbia University Press.

Hofstede G. (1991). Cultures and Organizations: Software of the mind, New York: McGraw-Hill.

Iacucci, G., Kuutti, K. (2002). Everyday life as a stage in creating and performing scenarios for wireless devices. *Personal and Ubiquitous Computing Journal, 6* (4), 299 - 306.

Kumar V. (2004). User Insight Tool: A Sharable Database for Global Research. In V. Evers, E. del Galdo, Dianne Cyr, & Carole Bonanni (Eds.), *Designing for Global Markets 6*, IWIPS 2004, Sixth International Workshop on Internationalisation of Products and Systems, Culture, Trust, and Design Innovation, Vancouver, BC, Canada, 8-10 July 2004. Product & Systems Internationalisation, Inc. http://id.iit.edu/papers/kumar_iwips2004.pdf

Lane G. (2003). *Bodystorming experiences*. http://proboscis.org.uk/bodystorming/

Leonard, D., Rayport J. (1997). Sparking Innovation Through Empathic Design. *Harvard Business Review, 75* (6),102-113.

Marcus A., Gould E. G., Cultural dimensions and global web user-interface. What? So What? Now What?,AM+A,2001. Available:http://www.amanda.com/resources/hfweb2000/AMA_CultDim.pdf [Accessed 16 February 2006]

Oulasvirta A., Kurvinen E., & Kankainen T. (2003). Understanding contexts by being there: case studies in bodystorming, *Personal and Ubiquitous Computing, 7*, 125–134.

Prahalad, C. K. and S. L. Hart (2002). The fortune at the bottom of the pyramid. *Strategy+Business, 26*, 54-67.

Prahalad. C.K. (2004). *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits*. New Delhi: The Wharton School Publishing, Pearson Education, Inc.

Russo P., & Boor S. (1993). How fluent is your interface? Designing for International Users. In S. Ashlund, K. Mullet, A. Henderson, E. Hollnagel, & T. White (Eds.), Proceedings of INTERCHI'93, ACM Press, 1993, pp. 342-347.

Sanders E. B. (2000). *Generative tools for codesigning. Collaborative Design*, London: Springer-Verlag.

Simsarian K.T. (2003). *Take it to the Next Stage: The Roles of Role Playing in the Design Process*. CHI 2003 Adjunct Proceedings, pp. 1012-1013

Sun H. (2001). *Building a culturally-competent corporate web site: An exploratory study of cultural markers in multilingual web design*. ACM Special Interest Group for Design of Communications. Proceedings of the 19th annual international conference on Computer documentation. New York: ACM Press, pp. 95-102.

Trompenaars F. (1993). *Riding the waves of culture: understanding cultural diversity in business*. London: Nicholas Brealey.

Zahedi F., Van Pelt W., & Song J. (2001). A conceptual framework for international web design. *IEEE Transactions on Professional Communication, 44* (2), 83-103.