Exploring Mediated Interactions: A Design Exercise

Dhaval Vyas[1], **Alan Dix**[2] and **Anton Nijholt**[1]

Human Media Interaction Group [1]
University of Twente
Drienerlolaan 5, 7522 NB,
Enschede, the Netherlands
d.m.vyas | a.nijholt @ewi.utwente.nl

Computing Department [2]
Lancaster University
Lancaster, LA1 4YR,
United Kingdom
alan@hcibook.com

ABSTRACT
With the emergence of personal and ubiquitous computing systems in the last decade, interaction designers have started designing products by employing quality oriented aspects such as user experience, playfulness, enchantment and others. In order to explore novel forms of mediated interactions, designers need to focus beyond the basic user requirements and usability issues. We present a procedure and results of a design exercise that we carried out with students of a master's course on Visual Design. Our intention was to explore new forms of mediated interaction by using a specific design exercise. We provide the details of the resulted design concepts and discuss the usefulness of our design exercise.

Keywords
Interaction Design, Design Methods, Mediated Interaction

INTRODUCTION
We believe that new forms of interaction techniques can be explored through using inspirations from our everyday interactions. We carried out a design exercise with a class of master's students in a Visual Design course. In the exercise, the students had to come up with a product concept that can be used to mediate communication amongst users. The students were asked to think about a communication metaphor from their everyday mundane experiences and design a new product concept based on it. We asked them to either present their concept as a sketch, mock-up or a story-board. One of the motivations behind this exercise was to see what new design concepts and interaction ideas could be generated by utilizing people's everyday communication metaphors.

We first describe the procedure of our design exercise. Next, we describe the design concepts that resulted from our exercise. In the end, we discuss the usefulness of our design exercise.

PROCEDURE OF THE DESIGN EXERCISE
Our exploration approach is inspired by several other creative design approaches (Djajadiningrat et al. 2000), (Hekkert et al. 2003) and (Hallnäs and Redström, 2006). We introduced the procedure of our design exercise to the master's students of a Visual Design course. We did not want to limit the scope of our exercise, so we asked all the students to individually design a concept of a communication device to support professional or non-professional activities. A main reason for keeping the exercise open and general was to gather a varied set of design concepts.

As a first step of this design exercise, we asked the students to come up with a communication metaphor from their everyday mundane experiences and use this metaphor in their concept design process. The students were provided with several inspirational examples to stimulate their creative thinking. As a second step, we asked them to design sketches, story-boards, mock-ups or scenarios of their conceptual devices. In the end of the session, they were asked to present their designs while other students and our teaching assistance team provided feedback.

RESULTS: FIVE INTERACTION CONCEPTS
As a result of our design exercise we gathered several design concepts encompassing different forms of mediated interaction. Figure 1 shows some of the refined design concepts derived from students. We inductively represent them into five categories: shared interaction (1a), editable interaction (1b), expressive

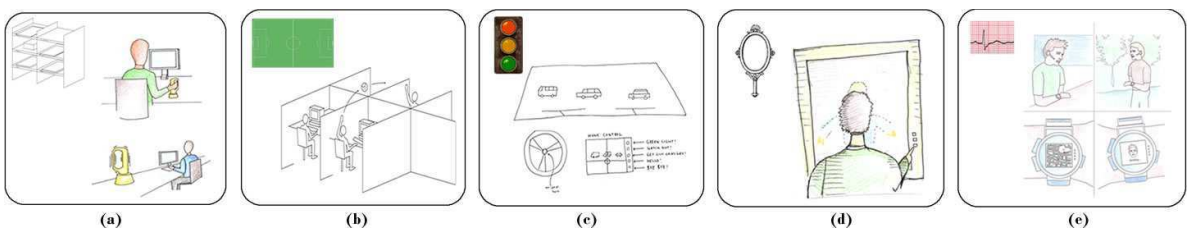

Figure 1. Design concepts generated using specific communication metaphor.

interaction (1c), direct interaction (1d), and transformed interaction (1e). A common attribute amongst these categories is that all these design concepts support distant or collocated communication utilizing different interaction and expression techniques. These design concepts are merely the result of our design exercise with the students. This is definitely not a complete list of mediated interaction techniques. At the same time, we do not claim to have produced totally new design concepts and interaction techniques. But more importantly, we emphasise the design process that is used to generate these results.

Shared interaction is where a technological artefact can serve as a tool that can be physically or virtually shared amongst the distant participants. Utilizing a metaphor of public post-box in offices, a student designed a tangible hand-shaking device (1a) to support remote non-verbal communication. When one person squeezes his/her device, the other person feels vibration. By squeezing the device harder or softer the device at the other end generates stronger or softer vibrations, which could express different hand-shaking patterns. *Editable interaction* allows technological artefacts to serve as buffer tool for collecting, adding and manipulating information or data. Utilizing a metaphor of football pitch, a student designed a content-recorder (1b) that can be thrown to others in a cubical office. Members can send and receive important files and documents by passing the ball to the intended person. In the *expressive interaction*, a technological artefact serves as a tool that can change its representational states to convey specific information to the distant participants. Using the metaphor of traffic lights, a student designed an aware honk-controller (1c) that helps drivers improve their traffic management skills. The device recognises the traffic situation and honks appropriately based on the criticality of the situation. In the *direct interaction*, technological artefacts can be used to transmit information between distant participants by establishing a direct communication channel. Utilizing the metaphor of a mirror, a student designed an interactive mirror (1d) that allows two users to communicate with each other remotely. Users can have synchronous communication via video conferencing as well as asynchronous communication by leaving hand-written messages on the mirror. In the *transformed interaction*, the sender's information is transformed into a more comprehensible modality. Using the metaphor of an electrocardiogram device, a student designed an interactive watch (1e) that allows two friends to see where they are on an interactive map. The watch gives a precise location of the person on a geographical map who also has a similar watch.

DISCUSSION & CONCLUSION

From the result of our exercise we observed that students came up with several different categories of mediated interaction: shared, editable, expressive, direct and transformed. These interaction styles ranged from direct to indirect and synchronous to asynchronous communications. In fact, the results that are presented here are only a few examples of novel forms of mediated interactions that are deduced after the design exercise.

The methodology used for our exploration may be questioned for its open-ended and informal design process. However, in a previous work (Dix et al. 2003), we have found that posing open-ended and radical design challenges and then inductively analyzing the results can be a powerful way to develop explicit knowledge of a design space. It was also evident from the resulted design concepts that our design exercise allowed us to capture a much broader perspective that goes beyond users' requirements and basic functionalities. We are now in the process of further analyzing both the categories and other aspects of the designs in order to construct more explanatory models.

Secondly, the use of everyday communication metaphor is inherently culturally-sensitive. By asking the students to use communication metaphors from their everyday experiences, we utilized students' familiarity and socio-cultural relevance of their everyday experiences. This means that some of the communication metaphors that we explored from the students, for example the 'open post-boxes' in figure 1a, have a very specific socio-cultural significance ("a private organization having publicly accessible mail boxes"). This is in fact a valuable aspect of our design exercise, as it implicitly involves social and cultural effects in the design process. Additionally, the metaphors that were provided by students came from different settings – ranging from sports, domestic to professional environments. Hence, an important point that our design exercise makes is that new mediated interaction techniques can be explored from our everyday mundane interactions.

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