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Bthere or be Square:

A Method for Extreme Contextualization of Design

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Introduction

The user is in focus in all types of user centred system development, but to what extent the user is involved in the process varies extensively (Preece et al 1994). In various types of design education of today there is often a focus on context awareness, meaning the designer is to become familiar with the user and the environment. In contextual design methodology (Beyer et al 1998) this is performed by user studies within the context, where results from interviews, observations, films and photos are brought back to the studio for analysis. Based on these findings, a user- and task analysis is performed, and requirements are set up in accordance of the information found in this phase. When evaluating, these requirements are used as measurements for success. This process is often iterative, meaning the different phases are done over and over again until the system is satisfying. In professions like architecture the awareness of walls and other physical frames is very high, but that is just one part of the entire context. This fact made us interested in finding a new way for designers to open their minds for more aspects of the context and create a method to find more input to their work. We wanted designers to understand that in many cases appearance is deceptive, that even things perceived as simple and obvious are more complex than you would think from start.

Design work is an unstructured process, since there from the beginning is no well-defined problem, the solutions and the problems are rather developed hand-in-hand (Schön, 1983). This means that the need for having direct contact with the context and its users is important throughout the design process, not only when data is collected or for testing purpose, but also when analyzing and brainstorming.

The goal for the *Bthere* method we propose in this paper is to give birth to new and perhaps controversial design ideas in the area of context-aware computing systems. Developing digital context-aware systems and artefacts has been a major direction for human-computer interaction (HCI), to explore new types of



interaction achieved by integrating computer technology with our everyday physical world. The area of interest has over the past decade developed in different directions with different names, but it started when Weiser introduced the notion of ubiquitous computing in 1991 (Weiser, 1991). The central idea is a future with computation embedded into the context around us, not using the classic computer interface, but rather a range of familiar looking devices with added functionality.

This paper describes a method for enhancing the context awareness among all types of designers, suggesting a way to bring the design work into the context, not to bring the users context back to the office. Thus enhancing context awareness in the designers' process as they develop design proposals. Although the method has only been used with architectural and design students, we believe that its applicability is general to most designers dealing with context; industrial designers, urban planners, artists, interaction designers and more.

The paper describes related work, the general concept of the *Bthere* method for designing context-aware computing systems, a workshop setup with architect and design students as participants using this method, and finally a discussion of the method and the results of the workshop.

Definitions in this paper

In this section some definitions used throughout this work will be presented. In the *Bthere* method described below, three different perspectives will be mentioned, physical, digital and social. We define *physical* as appearance, location, physical interaction, and physical time/space. We define *digital* as computer model, infrastructure, protocol, relative time/space. We define *social* as attention, activity, intention, understanding and communication.

In our experimental workshop, the facilitators of the method are referred to as the *workshop leaders*. The students that were participating in the workshop are called *designers* and the people from the context who contributed to the workshop as it progressed are called *contributors* – *both groups being participants in the design work*. Finally those who only passed by and were in the context are referred to as *inhabitants*.

Related work

Context in its general sense can be defined as something related to, but not within our current focus of attention. The general definition of context and its relationship with computation is a primary concern in HCI research. Dourish claims that the context in which ubiquitous computing systems are embedded into is used in two different ways, a technical and a social notion (Dourish, 2004). The first type encode context along with information to conceptualise human action and the relationship between the action and computational systems to support the technology. The second type dynamically analyzes certain social aspects of the context to have the behaviour of the system respond to patterns of use. Dourish' goal in his paper is to explore the relationship between technical and social aspects, and to examine the mismatch of these two. He does that by separating the context and the content of activities that people might perform. Our primary concern is that systems are responsive to the different social settings in which they are used, but we also claim that the context is more complex, and that there are more and dynamic aspects that the future design should be responsive to. The



Bthere method is therefore focused on spending the major part of the process in the context of the future design, and to analyse it in small steps.

In the field of participatory design, Mambrey et al (Mambrey et al, 1998) uses the term “osmosis” to refer to the multi-level information that a designer receives by visiting the workplace and having contact with users. They consider that this gives a rich picture of the users’ working life which cannot be reproduced in any other form, and that this contact encompass interviews, user workshops, active user services, and simply being present at the workplace. The *Bthere* method proposed in this paper is based on osmosis, but differs from (Mambrey et al, 1998) in the sense that also the design process is performed in the users context. In their work Mambrey et al describe that designers reported that they felt like a “sponge” soaking up information, while we would like to propose a more active role for the designer. We suggest that the designer should be both a collector and receiver.

Several methods are concerned with finding more aspects of the user and the use of things or environments. “Extreme characters” is a method that helps designers to explore sociocultural aspects of their designs (Djajadiningrat et al, 2000), and “Interaction relabelling” helps designers to understand the richness of actions (Djajadiningrat et al, 2000). Both of these are methods to use when finding inspiration and more aspects in the design process, but they are also trapped in the traditional way of designing in a sense, staying safely in the office or design studio, using their imagination. The *Bthere* method differs from this in the sense that we use the extreme characters from reality, not only providing us the opportunity to observe the phenomena and persons, their use of things and contexts, but also having contact with them and getting their direct input in the data collecting phase.

Gaver et al. (Gaver et al, 1999) present a method in which they use cultural probes that they hand out to the inhabitants of different sites, for them to personalize and then return their personal story to the designers (Dunne et al, 2001). Similar to this approach, the task of our method is to understand the particularities of a site. Both methods aim at providing possibilities to discover new forms of sociability and culture, and to be provocative through design. Furthermore the cultural probes were designed to live their own lives uncontrolled by the designers, as is the aim of our confrontation with the site by placing an open tent on the square. We confront an uncontrollable dynamic environment hoping it will bring us a better understanding of this context.

Just like Gaver et al. we are looking for inspirational data with our method rather than to define a set of problems, and hereby trying to create greater awareness of the complexity of the site. The data collected is inspirational for the design process and also as a way for us to ground designs in the detailed textures of a local site.

The *Bthere* concept

Context is a central issue in interaction design as well as in architecture, and we propose a method with an increased focus on the context in both the process and in the final proposals. The goal for the *Bthere* method is



to enhance the context-awareness in the design, by pushing the design process out into the context. By creating a deep and layered analysis of the context and the inhabitants while being in the context, the identification process of the tasks and behaviours can be adopted immediately in the design ideas.

The general concept of the method is to divide a site and its surroundings into different layers, and thereby unfold aspects and find depths that are not visible from the surface. *Bthere* aims at focusing on one thing at the time, discuss it from different perspectives, and finally connect them, instead of trying to study and register everything simultaneously.

The *Bthere* method is mainly divided into two phases; the data collection phase, and the design phase. During the data collection phase, three different *perceptions* or ways of looking at the city are to be considered during the day. The perceptions could be:

- Social
- Digital
- Physical

The perceptions are ways of looking at the context, and could be compared to wearing three different pairs of glasses. (see Figure 1). To every data collected, it has to be defined from a personal opinion why it was collected and what perception was used.

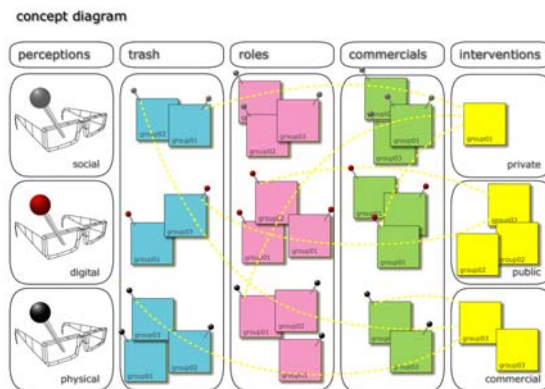


Figure 1. Table of the concept; The perceptions are ways of looking at the site, and used to define data from the three layers; trash, roles and commercials, which will be the base for the final interventions.



The perceptions are used during the data-collecting phase to look for material in different predefined categories, called *layers*, and these could be:

- Trash
- Roles
- Commercials

The layers are used to put words to and define details and aspects in the environment. The layers are revealed one by one, meaning that only one layer is in focus at the time. The layers are not to be presented from only your own point of view, the aim is to try to get into discussions with the people who are in the site using it, to also be able to present their opinions. Between each layer, the data collected should be physically presented, discussed and defined from its perception. Each single data should be physically annotated to a large shared surface, e.g. written down on a post-it note, with one colour for each layer. The shared surface should be a representation of the site, so that the data collected can be attached to the exact location of where it was found.

The second phase is the design phase, where the findings from the data collection phase are discussed in groups and combined in different constellations to be used as design material. It is a conceptual intervention based on the findings made in the first phase. The groups shall discuss, augment and intensify three different aspects of the shared design space in the context, i.e.:

- Public space
- Private space
- Commercial space

The goal of the design phase is to develop ideas that make a significant change to how the site will be perceived in the future, or how life is lived on the site. The collected data will be used to create new technological designs in both the digital, social and physical world.

The common denominator of the three layers is the fact that these are often unnoticeable aspects of urban environments, but at the same time we claim that it is often these aspects, along with a few others, that define a space as urban, bustling and interesting. Combining the three layers with the perceptions forces you to conceive the otherwise well-defined physical space in a new fashion. As an example, it is relatively simple for most architects and designers to analyze a site on the physical level, but when it must be defined according to what roles they play and shape for or dictate to inhabitants of that site, then they will see the square in a new light. We take a range of relatively well-known terms and then combine them to challenge the conception of the participants and to discover new aspects of the city.



The workshop setup

The *Bithere* method was used in a workshop that took place in Gothenburg, Sweden during one day in late spring, and there were 14 designers from three different architect and design schools. The context in focus was a city square, a bustling urban environment with many different kinds of activities and personalities during the day. It is a centrally located open site with trams, busses, cars and bicycles, a meeting place containing shops, fast food restaurants and open-air cafés. It is a heavily used public space, but still not touristic.

The setup was an open tent serving as a studio, containing a table in the middle. (See Figure 2). The 2,5 x 0,8 m table was partly covered with a large print of the square, which was attached to thick cardboard. A web-camera attached to the ceiling of the tent, documenting the activities on the table during the day, how the original map was covered with observations in layer by layer, how it was growing thicker and richer and finally how physical thread was used to link material from different observations together and outputted scenarios for interventions on the map. (See Figure 3).



Figure 2. The workshop setup with tent, table, posters, designers and inhabitants.



Figure 3. The map after the annotation process in the workshop; the disappearing physical square.



The designers were given the three different *perceptions*, or ways of looking at the city, at the beginning of the day. The three *layers* that the designers were to work with during the day were revealed as the workshop progressed, they were not only to look at them from their own point of view but also trying to get into discussions with the people who were in the site using it.

The designers had to define and relate their observations from each layer to one of the three perceptions, and then place a physical notation of it on the map where they had found it. The template of the notation were post-it notes in different colours describing the specific layer on which they were to write down the things or phenomena they had observed. Attached to the map were also photos shot by digital cameras and printed on the fly in the tent. Finally a coloured pin had to be added and hereby specify the point of the observation on the cartographic table. The colour of the pin defined the perception of the observation; whether if it was considered as physical, digital or social.

In the first part of the data collecting phase the task was to observe and collect things that were categorized as *trash*. During the discussion with the designers, trash was defined as something that had outlived its use or something that was disturbing to the atmosphere of the square, which of course brought forward the differences in opinions of what the designers would then label as trash. Examples of what the workshop labelled as trash was a surveillance camera considered as digital trash for one person, but considered as a security by someone else; an alcoholic could be defined as social trash, and noise from the streets and trams going by were defined as physical trash even though the workshop discussed whether it could be defined as a simple and maybe even appropriate aspect of urban space.

The participants worked in smaller groups of 3-5 persons, and lively discussions took place within that constellation of people, but also when presenting their observations and opinions to the entire group when placing it on the map. At this point, interesting discussions came up, and several aspects that the designers had never considered before were revealed.

During the day two more layers were addressed. These were focusing the designers' attention towards the roles played by people and the aspects of commercials in the urban environment through the way they shape e.g. movement and attention for the inhabitants of the site. Each of these observations were again annotated on their own colour of post-it notes, and defined as digital, social or physical by the pins.

The groups had to discuss the findings during the day, and augment and intensify three different aspects of the shared design space in the context, meaning public, private and commercial space. The three groups had to deal with one type of space each and in their work and presentation be aware of eventual overlaps, shared interests or conflicts with the other groups. Furthermore we asked the groups to make interventions without relating to the other themes, so that e.g. the group working with commercial spaces did not consider whether or not their idea would be disturbing to the ideas or goals of the group working with public space. In addition to this, the interventions had to activate and combine observations in the different layers. They should



investigate how different types of use and phenomenon's of the public space, positive and negative, can work together and thereby enhance the three aspects.

To demonstrate which aspects had been relevant for their ideas, they had to connect the relevant pins with a thread, and hereby illustrate the linking of properties and spatial relation between the observations placed in the different layers. Finally the results from the ideas and prototypes were attached to the map too.

Results from the workshop

The final task was for the three groups to come up with ideas on how to increase the private, public or commercial space within the context, and use the experiences from prior data gathering and analysis phases as a base. As a result from being in the context, the designers used experience prototyping (Buchenau, et al, 2000) when communicating the design proposals to the audience, to some extent while trying to understand the existing context and user experience, and when exploring design ideas within the group.

The ideas varied from pure physical changes to purely digital and from public to private use.

Examples of design proposals to enhance the private space are:

- Install a machine where you can pay to record your own movie and when you leave, you receive the movie on a DVD. The idea is built upon the fear people have for being in the scene when they see a personal or surveillance camera or video camera. When the machine is recording, a red lamp will blink, keeping other people away from that part of the site and thereby create a personal sphere in the public space. (See Fig. 4).
- Install live projections on a wall on the opposite side of the street from the entrance of a porno shop. By this the embarrassed customers can enter or leave the shop without being detected, since other inhabitants will study the live and colourful projection and not the door of the porno shop.



Figure 4. Design proposal from the workshop; A personal sphere is created when the video camera is recording, as people try to avoid exposure to the camera.

Examples of design proposals to enhance the commercial space are:

- An agent checking your personal profile through your phone when entering a certain space, so that when you pass a digital advertisement board, it will be adjusted to your personal needs. Examples of personal ads could be cheap drinks at the nearby bar to a 23 year old guy, or a picture of yourself with much thinner body as an advertisement from a plastic surgery. (See Figure 5).

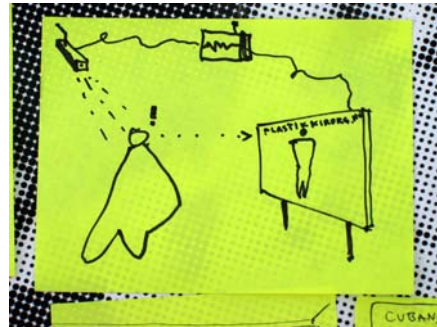


Figure 5. Design proposal from the workshop; Personally directed advertising from a plastic surgery.

- To have advertising from the local shops mixed with the live digital traffic information displays inside the bus stops.
- Have red digital tracks on the ground to lead people in to the fast food restaurant. They should be connected with the local transport system, so that when the bus stopped and the doors opened there would be a red light like a red carpet on the ground leading a potential customer from door to door. (See Figure 6).



Figure 6. Design proposal from the workshop; Red digital tracks leading the flow of potential customers into the fast food restaurant.

Examples of design proposals to enhance the public space are:

- A wide and large staircase up to the rooftops above the public plaza, to expand the public site, and creates a view and overlook over the square and its surroundings.
- A real time guide in your mobile phone, recognizing the surroundings and displays it in the phone with a digital layer of information; what is inside the buildings or the profile of the persons around you.

Apart from the actual design proposals, there were a number of interesting findings to be found from the paper representation of the square on the table. The map stores the layers of information, but also information about what was most relevant or inspirational for the ideas. The designers were asked to link the different data they had used in their ideas with a physical thread, so that one would get a visible proof of both the information but also the location of it. There were interestingly two needles that had been used in almost all the projects, and they were an advertisement board and the culture of illegal posters, both located very centrally on the square.



The results were of different quality, but they all had in common that they were pioneering to both the context and to the designers themselves. The sketches and discussions showed that the designers had expanded their view of the city, that they had learned something from observing reality by using different perceptions. During the day their arguments got stronger and stronger, and the designers learnt to discuss and to analyze aspects in a way they had not done before.

Discussion

The tent placed in the middle of an open square drew a lot of attention to the workshop. The inhabitants of the square, meaning the people passing by, people waiting for the bus or friends of the workshop participants, people living or working in the houses, or the people living on the street, all came in to the tent, and some of them contributed to the map with a new and personal aspect of the space, e.g. one person who joined one of the design groups and worked with them for the entire day and even participated in the presentation the following day.

When evaluating the workshop we compared the initial and the final map, and discussed if the final map maybe gave a more correct picture of the square than the original picture did. During the data collection and design process the accumulated design material were slowly obscuring the physical map and thereby redrawing and creating a new understanding of the square from both material and immaterial observations. Being on the site during the design session made it possible to state arguments through the design material and emphasize these by relating them directly to the physical context, due to the short visual distance. In that way the physical context and the new representation of the square began to complement each other in the discussion.

The use of the web-camera for documentation made it possible to have an ongoing discussion and evaluation of the process, meaning which types of data were collected where and by what perception, adding new discussions to the overall understanding of the design space.

The results from the design phase varied a lot, most of them were extreme and daring, and the proof of new thinking and inspiration. Other design suggestions were more careful and classic, but also new in the sense of being based on more untraditional design material. The method seems to succeed in providing an opportunity for the designers of the workshop to successfully focus on new aspects with different perspectives, and also with stronger arguments and provocative design ideas. Ideas that in themselves show new aspects of the context as in parallel with the concept of critical design.

One interesting notion that came out of the workshop was that data collected as trash, meaning as something negative, was applied directly into the design proposals. When these data became the base for their design ideas, the notion changed to positive. An example of this is the porno shop, which was negative trash from start, but turned into something positive and working as a base for a creative design proposal. The same was valid for the surveillance camera and the massive amounts of advertisements. In our experience, to incorporate negative observations into the design is not a common procedure and these are more often used as constrains for the design output.



Another common notion that came out of the discussions was a definition of public space as where a person is opening up to the surroundings either actively or inactively. Furthermore that a person can be in a public physical space, and in there define a private sphere through either social interactions, the use of physical objects, or by being connected through digital infrastructures. As opposed to commercial space, access to the public space is not dependant on social status or potential purchase, it is open to everyone.

This became especially clear during the day as we were approached by several residents of the square, who contributed their views to the data collection, and in one case joined a group and worked with them all day.

The background of the workshop participants had some effect to the outcome of the workshop. The designers came from various architect and design schools, and are therefore creatively minded and open to new perspectives. The major part of them was first or second year students with very little practical training, and none of them had computers as their major design material. Through the deep analyses and discussions in identifying aspects in the data collection phase, they gradually got used to not just the physical, but also the digital layer. When arriving to the design phase, they all adapted easily to using new and technology based design materials that they were not used to. The fact that they were not used to think digital infrastructures as design material was considered as positive, as they did not become limited by what ideas are possible or realistic or not to implement. On the other hand, if they would have had a more technological background, they would have been familiar with more advanced technology, and could have come up with other design ideas. Our conclusion was that for the context in focus, the background of the workshop designers was well suited.

Being on site

It is clear that in a prolonged design assignment it will not be possible to position a group of designers on-site for the entire design process, but confronting the information collection phases of the design process with the creating phase relates the designs strongly to the site. This is a known problem from some specific design fields and has been experimentally supported in e.g. the WorkSPACE project in various ways, where e.g. tabletPC's were used to enable landscape architects to design while being on site (Grönbäk et al, 2001), (Büscher et al, 2003). The method we are proposing here is much more open and therefore confronting towards the social and cultural, urban environment, simply because of the shared surface of the table in the tent is much more open than a tablet PC or any other shared digital device

On the other hand one can argue that the specific setup based on the open tent in a public square might frighten potential contributors among the public by its bare presence and maybe even be misunderstood as a political activity or a place hosting sale etc. To avoid the worst misunderstandings posters were placed out, explaining the project and inviting the citizens to take part in the workshop. Nevertheless the discussions in the tent challenged the contributors in terms of forcing them to argue in public and thus being prepared to defend their ideas and opinions to the other designers as well as bypassing strangers. This invariable openness did on one hand allow the designer to meet unforeseen input in the debate but might as well have limited and in worst case held back shy designers.



The possibility to actually be physically on the site in an open tent can be very dependent on the location, the time of year and the weather. The most important factor is though for the designers to be on the site in one way or the other, it could be a closed tent with windows, or a hired room nearby with windows out to the site, however, this would probably influence the participation from the inhabitants. In cases of rain or snow, the workshop construction could be a shelter for interested contributors and inhabitants.

The general method

We propose a method for the analysis and design process of contextual design in a public place which in this paper is exemplified in a workshop performed in the context of an open public square. The context could be of other kinds, we claim that the method would still give meaning and be highly usable to the data collecting and design process. The digital, physical and social perceptions are relevant and applicable to any type of context, but the layers can change depending on context.

If the context in focus would be e.g. a workplace instead of a public space, the layers of trash, roles and commercials would not have the same relevance. We claim that roles are an applicable and important aspect in all types of environments including people, but that trash and commercials could be changed to e.g. culture and information. In the design phase, the private and public spaces are still relevant, but the commercial space could be changed to e.g. forbidden or invisible space.

The most important aspect of the process is that the method allows one to, step by step and in layers, go through the data in the context. The iterative process of collecting, analysing, presenting, reflecting and discussing step by step, with one layer at the time, provides the designers with time to mature and with arguments to relate to. The perceptions are also very useful in the process of identifying, since you are forced to consider why this data is collected. To be in the context during the entire design process gives the positive outcome that things that were overlooked or forgotten will be updated, and you will always have the “power users” at hand to study, ask questions to or perform tests with. The attitude of the future users for the new design grows more positive as their involvement in the design process increases.

Apart from that the *Bthere* method can be used to identify hidden aspects in a context, and to generate new design ideas, it could also be used as a base for discussions. The data collected and the design ideas deriving from it can be used as a base for creating scenarios, and thereby discuss how the site is being used or misused. In a prolonged design scenario, it would be interesting to use the *Bthere* method for the major part of a complete design process, so that the user- and task analysis, the data collection and the design phase is conducted in the context. The implementation phase could then be situated back at the office, but after that one returns to the site and places the prototypes into the context to continue testing and conduct user studies there. A one day workshop with relatively inexperienced but very creative designers gave a lot, and we believe that the benefits of this method, when being used for a longer time and with more experienced designers, will grow even more.



Conclusion

This paper describes the *Bthere* method which aims to increase context awareness among designers to ensure that the designer is fully aware of the different layers, depths and perspectives within the context. Different design methods claim for increased context awareness, but this is mostly practiced in the data collecting and testing phase. The *Bthere* method places the designer within the context, not only for a limited time or for a certain part of the design process, but for the entire process. The concept of the method is to use different perceptions when collecting data, which is done from different layers in the context. These findings are then used in the design phase to enhance different aspects of the site.

The *Bthere* method is described in a scenario where it was used in a workshop held with architect and design students, and the setup was an open tent in a public square. The results from the workshop demonstrate that increased and active context awareness can be more effective in terms of performance and motivation from the designer's point of view.

Dividing the context into different layers, and at the same time focusing on different perspectives, in order to incorporate tasks and behaviours of users immediately into the design ideas, contributes to many positive aspects of the design process. The information gathering part of the design process becomes more tightened to the analysis process, since it is done simultaneously, both in private, in a smaller group and with the entire group. The proposed method also decreases the load of the designer, when trying to analyze and collect everything in the context and the use of it at the same time.

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