

Enriching social interaction using public displays

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Abstract— Public displays used for the purpose of displaying advertisements or helping the user to pass time, are widely spread nowadays. But there are much more possible applications, which can facilitate the work of an individual and open his mind up for his surroundings thus possibly initiating casual interaction. They are not only useful in public spaces where they can contribute to an open, communicative atmosphere or raise interpersonal awareness, but also in semi-public spaces like workplace or school. Those systems can make it easier to communicate with your colleagues be it work-related or private content and thereby help for a better working climate and foster collaboration, or in school environment contribute to awareness for others' work using the potential of working in groups to understand better and faster. I want to discuss these possibilities in my paper using the example of several projects from the literature.

Index Terms—public display, informal interaction, groupware system, digital communication, digital possibilities, interpersonal awareness, multi-user interfaces, community, peripheral display, interactive display, public space

1 INTRODUCTION

People are living in an active social environment. They communicate with their family and friends via WhatsApp, Facebook or phone calls while waiting for the bus thus quickly forgetting about their environment. Whereas cafes formerly were “‘homes away from home’, where unrelated people relate” [15], places to meet friends as well as strangers, now it seems like the prevalence of technology makes those places “physically inhabited but psychologically evacuated” [9]. With all the digital communication, analogue interaction with strangers, which often opens up one’s eyes for other opinions, is getting rarer. Public displays give an opportunity to show that digital media can not only separate people but, quite the opposite, bring people together. Nowadays public displays are most commonly used for advertisement or to promote “everyday information encountering” [5] like for example the displays in the Munich underground system with the purpose to ease your waiting time. But in this paper I want to discuss much more advantages than only those already mentioned. The new digital possibilities cannot only be used to substitute analogue social interaction but also to enrich it and increase interpersonal awareness. The different examples hereafter are sorted by their application area in “Work”, “School” and “Street” – public places where many people can be found and where they spend a majority of their time.

2 WORK

2.1 Use case

Working nearby your colleagues, there are more opportunities for informal interactions, which are important to stay in touch with them and thereby easier find the first steps for collaboration in the working place. They get considerably less the bigger the distance - in reaction there are groupware systems for distributed working groups designed to foster casual interactions. The question asked here is “how technology can support interpersonal awareness and interaction within small communities of colleagues” [6].

2.2 Examples

The Notification Collage [6] is a construct of a large semi-public display combined with multiple personal desktops. The system concentrates on its function as a public bulletin board for in most cases small groups of colleagues in a working environment. The large display is located in the research laboratory, a common area. The users post multimedia elements – such as live video from desktop cameras, editable

sticky notes, as well as digital photos and web page thumbnails onto a real-time collaborative surface that is visible to all members. You can act upon an item posted, if you click on a video for example, it will automatically open up a one-on-one video conference hence providing an easy-to-reach starting point for an interaction.

After the Notification Collage the developers went for another approach: the community bar [10]. The biggest of all differences to the predecessor is its design not filling the whole screen but only a small part on the right side by using a “sidebar containing resizable tiles” [10]. Previously subgroups were forced to work in the single public space of the Notification Collage thus they sometimes switched to other communication means when this was considered inappropriate. Now you can join different places representing real physical places or subgroups and each of those can contain multiple different multimedia items. The privacy problem raised in context with the Notification collage is dealt with by giving possibilities to set the level of fidelity and thereby affect e.g. the highest possible size of your profile picture others can display.

2.3 User Experiences

Interestingly enough it was discovered that people more recently used the systems on their personal devices while working than on the public display. The aim was to ease the everyday working process by making it simpler to communicate with commuters, people working in different rooms but also with people sitting next to you by providing faster access to needed information. Despite very little activity between co-located members was discovered probably because it didn’t prove that much more helpful than personal communication. What these projects were able to achieve was to enable work-related as well as personal communication with less effort, which is helpful because “informal interaction provides a foundation for social capital within organizations” [4] and also fosters work-related coordination and collaboration.

3 SCHOOL

3.1 Use case

Students working in pairs can see each other’s work and progress at a glance and learn from each other. In larger groups, keeping track of what is happening, is much more challenging [8]. However using a public display helps staying aware of what the other group members are doing and better comprehend their ideas and the system behind it.

3.2 Examples

The project Who’s who [13] is based on a single semi-public display projected on a screen at the front of the class which is navigated by many cursors at once. Every student has a different cursor which is represented by a different animal on the screen. The students can alter an artefact on the screen, see what the other students are doing and by cooperating and discussing find a solution together.

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In the DigiQuilt project [8, 7], elementary school children, ages 8 to 11, gain more knowledge about fractions and symmetry by “design[ing] patchwork quilt blocks that address a series of mathematical challenges” [8]. The software helps the learners see their created artifacts in a mathematical way built of fractions and symmetry. There’s a large display visible to the students, who each have their own, individual display with a mouse and a keyboard. When they save a design created on their individual displays, they can choose to share and upload it to the display, which is always displaying the 6 most-recent uploads.

3.3 User Experiences

By working together students learn to coordinate their actions and step-for-step construct an understanding of the formulas. By using Who’s who [13] on the display collaboratively, everyone makes his contribution to finding the right explanation. A between-groups study in two 9th grade science classes shows the difference between a shared display and many individual displays. The students were given an interactive animation of a lens and had to find the impact of the different factors. After that the students had to answer different content-related questions that required the application of the learned knowledge. The result indicates that the class that used the shared display demonstrated higher conceptual understanding and subsequently higher learning outcomes.

It is shown, that it helps students reflect on their learning, if they are thinking about their work from an audience perspective, particularly when the work embodies concepts the children try to understand. It was the project’s aim to increase the learner’s awareness of their class mates’ work and ideas with the use of DigiQuilt [8, 7] on the large display, so that they can keep track of what their peers are doing. The pilot study with 6 children in the computer lab showed that the children were much more motivated after they understood that there were many different solutions for the same challenge. Seeing a design they liked on the display, often was a catalyst for sharing and discussing their in-progress work with more than just the nearest neighbours, sometimes discussing or altering the design together. This proves beneficial since “when learners articulate their ideas about what they are learning, they remember it better” [16].

4 STREET

4.1 Use case

In public places everyone hurries past each other, rarely leaving time for getting to know new people. Public displays can help cultivate a community, increase interpersonal awareness and thereby, change the atmosphere of the public space.

4.2 Examples

The system behind eyeCanvas [2, 3] is based on the Plasma Poster Network - a flexible information storage and distribution framework designed to facilitate informal content sharing within groups. The main surface is a single big media item with a little overview of the latest content below. The touch-enabled portrait-oriented display is located at a café in San Francisco which is additionally used as an art gallery and location for evening events. The interface is showing café-related content like the menu, local and featured artists’ work, upcoming events, the opportunity of signing up for the cafe’s email newsletter and a comment application, which allows to “finger scribble” a message on the touch-screen. Its aim is to establish the framework for a social networking environment centred around the café, that compromises the offline as well as the online presence of the café visitors.

Flashlight jigsaw [1] is a puzzle game for multiple players who are each assigned a different colour. The aim is to jointly find all pieces of the puzzle by using your wireless handheld controller like a flashlight to search the black wall-sized screen and move it to its correct place. The teamwork comes into play as there are pieces that can only be revealed or moved when more than one of the virtual flashlights points at it at the same time, consequently the players need to cooperate to score points. Up to three players are supported but there is the possibility to switch to another available controller when there are less

players. Thus people are more likely to start to play the game as they can join or leave whenever they want regardless of the status of the puzzle.

4.3 User Experiences

The eyeCanvas [2, 3] was designed to build a sense of community and place attachment in the café over time by trying to supplement real personal communication with the richness of online social software. The reactions to the public display were largely positive. Half of the scribbles were mostly playful drawings, which sometimes responded to other messages allowing for a conversation between the costumers. It helped increasing interpersonal awareness and appreciation among those people who share the space of the café, but who may not share the same interests.

In society often seen as isolating and out of touch with the real world, Flashlight jigsaw [1] wanted to show that computer games can be anything else but that – they can be connecting experiences. They can encourage communication within groups of both already familiar and unfamiliar people, relating unrelated people. The goal of this project was to create a lightweight, simple to understand game, which can be joined or left at any time, for people of every age and with diverse backgrounds. It was installed and first tested in a laboratory of around 30 employees, who were all familiar with each other, and second in the public atrium of an academic building for two weeks. It was found that the majority started to play because they were curious, wanted to have fun, were asked by other players or had time left. It was seen as a problem if there were no other players and you had to play alone probably because you then had to switch between the controllers. By attracting people who interact as well as bystanders to gather, it achieved to change the atmosphere of the space. But some players did not like being watched and felt distracted and nervous while others did not care or on the contrary enjoyed spectators. This active engagement creates possibilities for social interaction among the passersby of the display. The effect is called social triangulation and was described as a form of engagement with a display[11].

5 CONCLUSION

Whereas the Community Bar project showed the possibilities of public displays to keep distributed working groups connected, Who’s who and DigiQuilt helped the learners to keep track of what their classmates are doing and to a deeper understanding by raising opportunities to collaboratively find a solution. EyeCanvas and Flashlight jigsaw were able to connect people by creating a social, collaborative space fostering communication and building a sense of place attachment.

In my opinion the Community bar project does not go together with all user interests because it does not provide a much easier or faster way to share media content than other traditional information distribution frameworks. An alternative idea for a better integration in the working process would be to make traditional ways of information sharing easier and faster to use instead of trying to substitute them. On the other side the Flashlight Jigsaw project allows a glimpse in the future of public displays as it is based on the user’s needs and improves the quality of public spaces [1]. Often there are concerns about safety of private information and difficulty “enticing the general public to start interacting” [1] while using public displays. Games don’t raise this concerns because there is only impersonal information concerned. Future projects should think in the same direction and try to design the social experience considering most importantly community interaction design, but also system interaction, content, system architecture and hardware as suggested in the P-LAYERS model [12], which can be a valuable aid in the development and deployment of public displays for communities. In summary it can be said, public displays combined with these groupware systems prove that they can create connecting experiences and enrich social interaction. In the field study around the project Looking Glass [14] it was found that groups much more often interact with displays than people that are alone and therefore the design should always support group interaction. Hopefully this upcoming tendency of using gesture control will get public displays to the next level to connect even more people.

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