

Exploring Community Building with an Awareness Display

Dhaval Vyas^{1,2} Anton Nijholt², Anton Eliëns³ and Wim Poelman¹

¹ Design, Production & Management

University of Twente
the Netherlands

D.M.Vyas@utwente.nl

² Human Media Interaction Group

University of Twente
the Netherlands

A.Nijholt@utwente.nl

³ Department of Computer Science

Free University of Amsterdam
the Netherlands

Eliens@cs.vu.nl

ABSTRACT

In this paper, we present a field trial of a pervasive system called Panorama that is aimed at supporting social awareness in work environments. Panorama is an intelligent situated display in the staff room of an academic department. It artistically represents non-critical user generated content such as images from holidays, conferences and other social gatherings, as well as textual messages on its display. It also captures images and videos from different public spaces of the department and streams them onto the Panorama screen, using appropriate abstraction techniques. We studied the use of Panorama for two weeks and observed how Panorama affected staff members' social awareness and community building. We report that Panorama simulated curiosity and learning, initiated new interactions and provided a mechanism for cherishing old memories.

Categories and Subject Descriptors

H.5.3 [Group and Organization Interfaces]

General Terms

Design, Human Factors

Keywords

Social awareness, field trial, qualitative research

1. INTRODUCTION

Community building is a group phenomenon that takes place in an environment where its inhabitants feel a sense of belonging and where the community is one of possibility, generosity, and gifts, rather than one of problem solving, fear, and retribution [4]. For supporting community building, an 'inclusive' environment needs to be established so that all its inhabitants can exercise their participation in different activities. We believe that the notion of social awareness can be used to enhance community building in work environments. Dourish and Bly [5] have described social awareness as follows:

"Awareness involves knowing who is 'around', what activities are occurring, who is talking with whom; it provides a view of one another in the daily work environments. Awareness may lead to informal interactions, spontaneous connections, and the

development of shared cultures all important aspects of maintaining working relationships which are denied to groups distributed across multiple sites."

In large organizations, social awareness is sometimes neglected in the tension between heavy workloads, time clashes, a lack of social encounters between employees, and a lack of suitable platforms that allow one to construct and convey one's identity [3]. There is an ongoing effort to design tools to support social networking and facilitate connections between employees in large organizations. Companies such as IBM have attempted to explore this phenomenon using tools such as SocialBlue (formally IBM Beehive) [22] and Honeycomb [16] in their own organization. Secondly, awareness within work environments may not be seen limited to work-related information, activities and relationships. Mediating somewhat casual and engaging encounters related to non-work issues could also lead to meaningful, pleasurable and ultimately productive experiences.

In this paper, we explore social awareness and community building using a technological intervention. We report a two week long field trial of a pervasive system called Panorama that mediates cues for social awareness, utilizing both user-generated and system-generated contents, in an academic work organization. Panorama empowers the staff members to participate in a community building exercise by letting them announce updates about their personal and social life and express feeling of care and belonging. The results of our field trials showed that Panorama simulated curiosity and learning, initiated new interactions and provided a mechanism for cherishing old memories. We believe that in a longer term usage scenario Panorama could enhance community building as it provides an interactive platform for its users by allowing them to participate, share and communicate.

In the rest of the paper, we will first introduce the Panorama system and the design logic that is used in it. We then describe the field trial by providing details of the setup, methods and participants. Next, we provide the qualitative analysis of our results. And finally, we discuss our work and draw conclusions.

2. PANORAMA

Panorama is a large screen display intended for a publicly accessible area of an academic department. Panorama attempts to mediate cues of social awareness through visual information. It is meant to enhance social awareness in a playful way by displaying non-critical and non-work related information about co-workers. Panorama utilizes the two 'design implications' developed from our earlier fieldwork [17, 18] in the department: self reflections and casual encounters. These two implications are supported by the following means, respectively. 1) Staff members can send images, video and text messages pertaining to their personal, social or work-related activities to the system, and these are

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displayed in a semi-artistic fashion on the large screen of Panorama. This way Panorama allows members to express their interests, thoughts and sentiments. 2) Panorama also collects information from the department using cameras – distributed around the public areas of the department and represents this information on its screen in the form of live video streams and images. In this way, it captures casual encounters from the physical environment of the department and presents them on the large screen. Panorama was conceived as a ‘calm technology’ [20]. At times, Panorama became the center of attention and a topic of discussion (at least, in terms of its contents) and, at times, it just ran in the background of staff members' peripheral attention. In the latter case, staff members could go on chatting and eating their lunch without being bothered by Panorama.

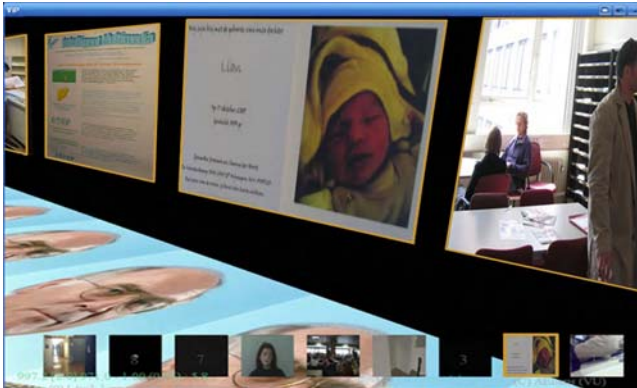


Figure 1. A screenshot of the Panorama interface.

For designing Panorama, we utilized an existing technology called Virtual Poetry (ViP), which was originally developed for creating an augmented reality theater production [6]. ViP is a complex representation system based on DirectX9. It allows projection of live video feeds, digital video clips, texts and sequences of images on an immersive 3D space. The ViP system also allows a variety of visual effects, including texture mapping of image feeds on 3D objects, overlays of multiple image textures, as well as particle systems with streaming image feeds projected on sprites. ViP can be seen as an umbrella platform for representing different visual information, where representation style can be adapted to suit a particular need. For conceptualizing the Panorama interface, we adapted the representation of ViP to show a *continuous* and *always on* interaction. As figure 1 shows, there are two planes of the Panorama interface, both presenting visual information floating in opposite directions -- providing a feeling of *walking through a corridor*. Panorama can take inputs from nine different channels, which are shown at the bottom of the Panorama interface. This, in a way, informs the staff members what to expect on the vertical plane of the Panorama screen. The speed of flotation of the images is adapted from the sensor information in real time. When cameras in the public area detect increase in people's movements, then the speed of visuals on Panorama increases. This particular functionality is devised to indirectly inform staff members about the activity level in the department.

The goal of the Panorama system is to enhance social awareness by providing interpersonal and rich information related to staff members and their everyday interactions in the department. Panorama provides a facility to support staff members' creativity and playfulness and should not be seen as a tool that attempts to support work-related activities. We wanted to explore if

Panorama in the staffroom could allow different users to speculate about what was happening in the department. This non-selective information could allow affective, engaging and reflective interactions between the staff members. Panorama utilizes information about self reflections and casual encounters in the following ways:

- *Self Reflections* are explicit user initiated interactions. Staff members can contribute towards the ongoing activities of the overall environment with their personal and non-critical information or data. Here, Panorama serves as a tool that allows staff members to support their social needs, such as sharing non-work related but highly sentimental news (e.g. announcing the birth of a child), personal achievements, and personal interests (e.g. concert visits, favorite books). In this case, Panorama does not passively receive feeds from members. It represents it in a manner that conveys the liveliness of the environment.
- *Casual Encounters* are implicit system initiated interactions. In this case, Panorama proactively collects information about the ongoing activities within the department and offers resources of potential interest from the environment. Panorama serves as a mechanism by which staff members can be socially aware by knowing each other's presence, social events and other relevant non-critical activities within the department. In this case, even though members passively receive information from the technology, they can actively comprehend the implications of their action (either alone or in groups) on Panorama.

Broadly speaking, Panorama receives both explicit and implicit awareness information about the staff members and their activities and represents this onto its display. The Panorama interface is like a virtual gallery, where on the wall and on the floor information about social awareness is presented. Figure 1 represents the ‘idle’ environment when the activity level is minimal. As activity level increases it transforms the representation first into the ‘live’ environment (representing the normal activity level) and then into ‘chaotic’ environments (representing hectic activity level). We used motion and noise sensors to detect the activity levels in the common spaces like the staffroom, the printing room and the main corridor. In both cases the activity level within the department is represented by the change of speed, color, abstractions (e.g. using shader) and overlays of 3D objects and particles.

3. FIELD TRIAL OF PANORAMA

Learning from the early assessments of Panorama, we planned to carry out a more realistic and a longer term field trial of our system. We would like to emphasize that it was not our aim to evaluate the technology, but observe and understand the effects of the technology on staff members' behaviors, interactions and interpretations. Boehner [2] argues that a technology is bound by the ineffable – the aspects that cannot be fully known or understood through explanation or measurements but must be experienced. As Bodker and Christiansen [3] argued, social awareness cannot be measured precisely as it is a subtle and implicit aspect and does not meet the eye. Hence, in this case, assessing the effects of Panorama on the staff members would be to explore their experiences of being socially aware, being able to interpret (or even speculate) other staff members' social activities, and subsequent interaction that is triggered by Panorama. In the following, we provide the details of the field trial including its setup and methods used to collect data from the field.

3.1 The Setup

It was clear from our fieldwork [17, 18] that the staffroom was an important place that staff members visit during their everyday activities and routines. For the longer term field trial, we chose to deploy Panorama in the Human Media Interaction (HMI) research group, at the University of Twente. HMI had 48 employees, 8 of them working part-time. HMI had its own staffroom which was colloquially referred to as *Rappa* within the group. This room was often visited for routine activities, such as collecting mail or using the photocopier. In addition, staff members commonly met in the Rappa for social activities such as eating lunch and having informal chats with co-workers or celebrating staff members' birthdays. We deployed a large screen display in the Rappa, running our Panorama application for two weeks. For studying the use of Panorama, participation of staff members was absolutely necessary. We invited members to submit the images, videos and text messages that they wanted to show to their colleagues. We also created a Facebook group where they could store images, videos and write status messages that they want to display on the screen on Panorama. During the early discussions with the staff members we found out that they showed reluctance to having camera-based sensors in Panorama's installation. Hence, we decided not to include wireless camera in the public areas of the research group. Only one camera was placed in the Rappa. Figure 2 shows the setup of Panorama in the Rappa. The display was placed in one of the corners of the Rappa to allow unobtrusive interactions.



Figure 2: The Panorama system and its setup in the Rappa.

3.2 Methods

We attempted to collect data from multiple sources using different methods. We used two main methods: 1) observations, and 2) semi-structured interviews. Two researchers worked on this field trial, collected data separately and then corroborated data at the end of the trial. In the following, we provide details of our methods and participants.

Knowing the 'peak hours' of activity in the Rappa, observations were performed around the lunch hours. The system ran in a corner of the room while staff members from the HMI group could walk in and leave whenever they wanted, as they would usually do. On the opposite side of the room, behind a filing cabinet and some large sight-blocking panels a place was created to observe activities in the Rappa while Panorama was running. An observer sat quietly at the back of the room with just enough space to view the people in the room and the system, but obscured enough not to disturb the activities in the room. A sound recorder was connected to the laptop of the observer, to ensure that

interesting details of the interaction between people were not left out. Furthermore, notes were taken at the same time to note the number of members in the room and of the interesting interaction between Panorama and the members in the room.

The HMI staff members were encouraged to send in photos and videos through Facebook and email. This could be anything from past HMI events to more personal contents, such as, holiday pictures and everything else they wanted to share with others. The sequence of the series of photos was randomized and distributed over the nine available sliding containers in Panorama. Observations were performed over a total of eight days, spread out over two weeks. An estimated total of 30 members visited the Rappa while Panorama was active, consisting of HMI employees and visitors from outside the department. On average, 10 members were present at the same time in the Rappa, each day at the 'peak hour' during the lunch breaks. Their reactions to the Panorama system, interactions and conversations served as input for the observations. Table 1 provides the details of our participants.

No	Position	M/F	Age group	Years in the department
1	PhD Student	M	20-29	Recently started
2	PhD Student	F	20-29	Recently started
3	Post Doc	M	20-29	5
4	Post Doc	M	30-39	5
5	PhD Student	M	20-29	3
6	Researcher	M	20-29	6
7	PhD Student	F	20-29	4
8	PhD Student	M	20-29	1.5
9	PhD Student	F	30-39	4
10	Secretary	F	50-59	10
11	Secretariat	F	40-49	18
12	PhD Student	M	20-29	1
13	PhD Student	M	20-29	3
14	Senior Lecturer	F	50-59	14
15	Technician	M	40-49	13

Table 1. Details of participants.

4. Results

For this section, the voice recorded data from the interviews and observations were combined together to form a large pile of information that contains all the reactions from the employees of the HMI department. The next task was to order, categorize and analyze all these statements and conversations. The qualities and interesting aspects of Panorama can be described in a few categories that will be explained below with a number of examples. A lot of quotes from the observations and interviews are directly cited as examples of these categories.

4.1 How Panorama was perceived

As a part of their daily routine, staff members would come to Rappa to, either, collect their prints, check their post, have lunch on the sofa, use the microwave oven, have informal meetings with colleagues or use stationery – that were stored in a cupboard in the Rappa. The placement of Panorama in the Rappa meant that it was going to be seen (or interacted with) only when staff members would enter Rappa. In our two-week long field trial, we observed that Panorama in the form of a large screen display was overall appreciated by all the staff members.

In the beginning, the novelty aspect of Panorama played an important role in staff members' visits to the system and paying a focused attention. Panorama itself is not a system that allows staff members to directly interact with it. Hence, after looking at some of the pictures, videos and reading news items, staff members just continued their everyday activities. However, there were occasions where several of staff members would stay in the Rappa for a longer period of time. One of the examples of such an activity was during the lunch hours. Some of the staff members routinely had lunch in the Rappa. The deployment of Panorama added a new dimension to their lunch activities. In this case, Panorama was conceived as a 'calm technology'. At times, Panorama became the center of attention and a topic of discussion (at least its contents) and, at times, it just ran in the background of staff members' peripheral attention. In the latter case, staff members went on chatting and eating their lunch without being bothered by Panorama. It was in fact an intentional design strategy that we considered for conceptualizing the design of Panorama – that the system should not be intrusive in staff members' everyday activities. Figure 2 shows a typical lunch gathering in the Rappa. In this figure, one can see how some of the staff members have rearranged their chairs and their sitting positions to be able to see the contents running on Panorama. Here, the novelty and curiosity aspects of Panorama played an important role in staff members' interest and behaviors. Here is a comment from a staff member who was present during the lunchtime and had sufficient exposure to Panorama: *“It stays on the background, because it's only visually active. Today we had some long discussions and that thing was just running on the background, so we didn't even discuss it. That would probably be related to the news value as well. You're watching it now and then, but not constantly. So if you put in some new pictures it might lead the conversation a bit. But then it has to draw attention a bit. we did notice that pictures draw more attention than the text, because that was always the same.”*

4.2 Types of information sent

Although, we left it completely to our staff members to send any type of visual information that they thought appropriate to Panorama, we did find some patterns in their sent images and texts. The images sent to Panorama can be generally categorized into staff members' conference and other official visits; the group's outings to different places; individual staff member's personal life, interest and trips; some funny pictures of the staff members and images from the old time (80s and 90s). The number of submitted pictures ranged from about 30 on the first day to 300 at the end of the field trial. Figure 3 shows a few examples, where 3a shows a picture from a conference where a demonstration was being carried out, 3b shows the group's outing to a nearby historical town, 3c is a wedding picture of a member, 3d shows two members posing a funny shot and 3e shows an image from the late 80s. Apart from these, some members sent pictures of their children and pets, funny magazine clips (e.g. PhD

comics) and their hobbies. In particular, images pertaining to a member's hobby were frequently seen on Panorama. For example, images pertaining to staff members playing musical instruments, ballroom dancing, and sports activities were often seen. A motivation behind such a pattern was to explore common interest in their colleagues.

There were a very few examples of videos being sent to Panorama. These were mainly from different social gatherings and staff members' vacation time. The textual messages were about work related and official announcements. Staff members sent messages about new developments in their research, new project proposals and the like.

In the following, we will provide details of our results focusing on four important characteristics of Panorama: 1) stimulating curiosity, 2) learning new things, 3) initiating interactions and 4) cherishing old memories.

4.2.1 Stimulating curiosity

One of the interesting aspects that came out of our field trials was the way Panorama initiated curiosity among staff members. Panorama promoted a level of curiosity that went beyond its novelty aspect and was observed throughout the two weeks of our field trial. We observed that often staff members got curious by the content they saw on Panorama, and they started asking questions, which eventually led to discussions. The usual reactions of the staff members included sentences such as 'where was this picture taken?' and 'who is that person?' In the following, we provide an excerpt of a conversation that took place during a lunch session in the Rappa that will illustrate the curiosity aspect of Panorama.

Staff member #: "Whose photos are these? Did you send photos?"
Staff member #: "No"
Staff member #: "There are some photos I don't have, these I don't have. It's from the spring school"
Staff member #: "Some from when we went to the Mexican restaurant, I think Christian sent them"
Staff member #: "Look, this is from the spring school" (people pointing at the screen)

The above excerpt shows discussions about two separate events from the pictures that were shown on the Panorama screen. One of them is about a group of people who went to a Mexican restaurant and another one is about a spring school in which some of the staff members (mainly PhD students) participated. Not all members knew about such activities and these images provided a level of curiosity among staff members to discuss these events while having lunch. The simple fact that images are moving on the screen and keep getting interchanged with other pictures draws a lot of attention from the users. But Panorama does not completely pull them from their daily routines to forcibly look at the system. So it does draw the attention, but it is not too



Figure 3: Example images sent by staff members to the Panorama system.

distracting. Also, Panorama had a continuous representation, new images passing through the screen would not be easily recognizable to the staff members and this was an aspect that initiated curiosity. At times, staff members sent pictures that were unknown to some of the members. For some people this supports their curiosity while watching Panorama, because *"if you see only a few pictures you don't know, the urge to ask other people about it would be bigger than when you don't know anything about most of the content"*. So it can be stated that there has to be a balance between content that the user knows something about and content that is completely new to him. If he knows everything, there is no reason to keep watching.

Here is another example of a one-to-one conversation during the lunch hours.

Staff member #: "Who is this girl?"
Staff member #: "She's a colleague"
Staff member #: "Is she married?"
Staff member #: "Didn't you know?"
Staff member #: "No"
Staff member #: "Like ten years ago? Not last week."

This conversation is mainly initiated from some pictures a staff member sent to Panorama. She worked in the department for a few years on a part time basis. Other members did not know much about her. When she sent the pictures of her marriage to the Panorama system, it initiated a lot of curiosity among staff members. In particular, the fact that she had been married for almost 10 years and no one knew about it was very surprising for most of her colleagues. When these pictures were shown during the first few days of our field trial, it received a lot of questions from the other members in the lunchroom. Also during the interview session, the example of this particular staff member was mentioned again and again. One staff member commented: *"Of some pictures I do wonder where they are from, who took them and who are on them, because I don't know them. There's a great difference between pictures of events that you did attend to and those that you didn't. For example, the pictures of Hannah's wedding were nice to see, because I didn't know about it and she's not here that often."*

In the interviews, staff members indicated that they also got curious and interested by the content they saw on the Panorama screen. The most logical explanation for this was that members had some point of recognition when they saw a picture that involved a colleague or a familiar setting. Sometimes, staff members saw pictures of themselves that they never knew existed. On other occasions, staff members could recognize pictures they took themselves on the Panorama screen, even when they did not intend to send to Panorama. This frequently happened because multiple copies were spread across the department, at a particular time of an event. They also might want to see the reactions of others on their content. Other examples were those where the Panorama user was present at the concerning event, but might just not know that any pictures were taken that day. In that case the user could ask others to exchange these pictures. A common response in the interview was that a person's attention was drawn by things that were moving on the screen and *"my own content. Not the things that I see myself, but the things I made myself. I know I've made them myself, so if someone takes them from somewhere I recognize them easily."* The level of curiosity was maintained by Panorama throughout the two weeks. This was mainly due to the fact that staff members did send their pictures,

videos and text messages almost everyday. Staff members noticed changes in the content of Panorama and this led to a motivation to check Panorama out everyday. Here is a comment that we received during our observation session: *"Now all the wedding pictures of Hannah are out, that we saw yesterday all the time. Maybe they get changed every day."* For staff members it was hard to predict the exact sequence of images being presented on Panorama and hence they kept looking for new content. This randomness of Panorama supported the curiosity in staff members throughout two weeks: *"Maybe because the content drops in randomly, you have to keep looking if something new is happening."*

4.2.2 Learning new things

Staff members developed knowledge about new things regarding the department as well as about their colleagues by looking at Panorama. Some of the staff members used Panorama to inform about the ongoing and new activities the group is involved in. A week before our field trial, the group had an official photo session to place pictures on the group's website. A technician who was the first to have these pictures sent them on Panorama to allow others to see these pictures. This way he used Panorama to announce the arrival of these new pictures. During a lunch session in the Rappa, this initiated a lot of pleasant reactions and talks between staff members. The following are some examples:

Staff member #: "Hey, wow, our group photos"
Staff member #: "How come these are on Panorama?"

In another case, a senior member in the group posted two messages to Panorama, announcing some collaborative activities with another institute.

—"HMI to collaborate with the University of Trento on a joint Master's degree."

—"HMI involved in a proposal for an Erasmus Mundus European Master's degree."

This kind of announcements initiated a lot of interest in other staff members and led to conversations and discussions during lunch hours. In some cases, members asked the senior researcher to elaborate on such news. The following are some reactions:

Staff member #: "What's with Trento on a joint master's degree?"
Staff member #: "something HMI is working on?"

The project manager in the group also used Panorama to make an announcement related to her work. She normally, kept track of staff members working hours on different national and international projects. She sent a text message stating: *"Please fill the time sheet till week 22nd and may be some English biscuits will appear."*

In addition to the work-related announcements, we also observed that staff members gained knowledge about their colleagues while viewing Panorama. In nearly every interview we did, the example of the female colleague, who worked part time, was mentioned. In this case, several of the staff members in the group did not know the fact that she was married. One of the members commented, *"If you see different sides of people, it helps a lot, normally you only work with them and now you see their holiday pictures, wedding pictures and such. So you know more about their personal things, such as their partners and hobbies."*

Panorama was of some interest to PhD students who were new to the HMI department. Panorama provided especially for them as an extra opportunity to learn about other people. The following except shows a conversation between two colleagues, one of them recently started working in the group. In this case, a very strange picture of a girl having a snake around her neck appeared on Panorama. This obviously, made other members curious.

Staff member #: "Who's the girl holding that snake?"
Staff member #: "No one knows, it's a secret" (laughs)
Staff member #: "It's your girlfriend, isn't it?"
Staff member #: "Yes, so now it's not so secret anymore"

A lot of content that was sent in by the HMI employees featured trips to cities and other events, such as conferences or celebrations. Some examples of the specific topics that people learned about were holidays and events that people of the HMI group attended to: *"It's fun to see old pictures of trips and to see the differences of people who were there and who are still at the department."* In a different example, during a lunch hour, several pictures of different animals and wildlife appeared. This was clearly very unusual from other pictures; hence it initiated discussions about these pictures. The following is an excerpt from a conversation, which led to the information that a staff member went to Kenya and had done safari there during his holiday.

Staff member #: "What's with the giraffe on there all the time?"
Staff member #: "Because someone went to Kenya"
Staff member #: "Ooh, so we want to show off"

4.2.3 Initiating interaction

The images staff members saw on Panorama triggered new conversation points, funny comments and behaviors in staff members. At a certain time it also evoked certain expectations among the staff members. While looking at Panorama during lunch hours, a conversation might be started out of curiosity, which often led to new knowledge for staff members. This category is closely related to the previous two categories about stimulating curiosity and learning new things.

It was quite frequently observed that the presence of Panorama in the Rappa initiated conversations. One of the main reasons for this, we believe, was because of the lack of context provided in the pictures. As one of the staff members suggested, *"You do miss context a bit, if you don't know where the pictures are from. During a lunch time, by looking at Panorama, someone asked 'why is there a picture of a giraffe' and then someone starts explaining about it."* This shows that certain aspects needed more explanation and there was always somebody who could provide this missing context to provide a complete story behind such an image. We also found that some of the contents of the Panorama initiated conversation about common interests between a group of staff members. In one case, a member suggested that he would send his pictures of his ballroom dancing classes. Subsequently, a colleague responded by acknowledging similar interests, which then lead to a longer conversation between these two members. In another case, by looking at a picture from an academic conference, staff members started discussing how the conference was and about a member's research interest. The following is an example where an image taken during a group outing led to talks about football.

Staff member #: "That's pictures of our trip to Deventer"
Staff member #: "Deventer got a beating by Ajax the other day"

Although interaction with the Panorama system itself is minimal, it did create some playful situations during the observations. The lack of context from some of the images also led to hilarious comments and poking of fun at each other. A web cam was connected to the Panorama system that showed a live video stream (recorded in the same room) on the screen. At first, people did not like the fact that a camera was pointed at them. But already the first day people started moving around the camera and eventually it pointed at a piece of paper with "Frans is gek" (Frans is crazy) written on it, as a practical joke. Some technical issues caused the video stream to pop up more than usual on Panorama. This joke kept getting repeated a few days in a row with new comments everyday. In some cases, staff members made fun of some images. The following is an excerpt of a conversation that took place during lunch time in the Rappa. By looking at a funny behavior of a colleague, staff members present in the Rappa started speculating about him.

Staff member #: "That's one drugged picture, he doesn't look fresh"
Staff member #: "No that's normal style" (sarcastically suggested)
Staff member #: "Looking drunk with ice-tea" (laughs)
Staff member #: "but you don't know that it is ice-tea"
Staff member #: "a big bowl of whiskey"

In other cases, images on Panorama evoked funny comments from staff members. The following comment was given by a staff member, while looking at a picture of a colleague wearing a strange costume:

– "I didn't know we had an astronaut in our group."

Our observations also found that with the presence of Panorama in the department, some staff members built 'expectations'. Some of these expectations were motivated towards getting comments from other staff members and inviting members to talk about it. At a certain moment during observations, people came in to look at the specific pictures they sent to Panorama. One person invited a guest to show him the pictures she sent in. People sat in the direction of the screen, so they could watch Panorama while they were eating. The following example shows a conversation excerpt, where a staff members expresses her expectation about talking about herself.

Staff member #: "Everyone is ignoring me a bit today"
Staff member #: "That's the only thing that we can't do because of this screen" (laughs)
Staff member #: "Well, normally nobody looks at me"
Staff member #: "But I said 'Hello' to you the other day at the bar"

The excerpt shows how some staff members built expectations to be commented upon when their images are shown in the Panorama.

4.2.4 Cherishing old memories

In the department, the permanent staff members had been working together for a long time. On the other hand, PhD and Post-Doc researchers were temporary employees. Over the years the department saw people coming and leaving, with a lot of reminiscence. Staff members sent several images pertaining to different events, celebrations and social gatherings at conferences from the past. While coming across Panorama, and especially during lunch sessions, staff members talked about past memories and some funny moments with their previous and current colleagues. In the following we provide some examples.

Staff member #: "That's us in Deventer"
Staff member #: "I also want this picture. I saw it several times this week. But I don't have it."

The above excerpt of a short conversation happened when some staff members saw a picture taken during the group's outing to a historical city called Deventer in the Netherlands. The group spent a whole day together exploring the city. A staff member commented, "It is fun to see old pictures of trips and see the differences of people who were there and who are still at the department. Then you would like to see more content. But a good thing is that there is always somebody explaining the picture if they recognize it. Like the thing where Henry fell and broke his wrist while ice-skating."

Staff member #: "Hey, who's that to the left of me?"
Staff member #: "Andreea?"
Staff member #: "It's on her goodbye party"
Staff member #: "That's Andreea before she left; she arranged a dinner and some of us went there"
Staff member #: "Aow, quite an old picture"

The above excerpt is another example of reminiscing of events of social gathering when one of the staff members' was leaving the group. These conversations did not last long as the continuous representation of Panorama meant that there would be a new image in a few seconds. Additionally, the secretariats had a huge collection of pictures from the previous 20 years. During our field trials, they sent these images to Panorama, which led to interesting discussions between staff members, especially the new members. For example, figure 3e shows a picture of an outing in the early 90s. Some of the new members were pleasantly surprised by seeing old pictures. Some members had very funny reactions at these pictures. Following are some examples of these reactions:

- "Did Anton have black hair?"
- "Ohh yeh, this looks like Dirk."

5. Discussion

Ubiquitous computing [19] researchers have spent many years augmenting workplace organizations with technology in the quest to create smart workplaces [1, 21, 12]. However, as we mentioned in the introduction of this paper, non-critical and non-work aspects of workplaces could also lead to more pleasurable, sociable and playful experiences. In this case study, we used a notion of awareness that focuses on the non-critical aspects of work environments including playfulness, experiential and other social aspects. We have described Panorama – a large screen display that playfully mediates cues to support social awareness in an academic work organization. Panorama allowed staff members to send their interpersonal information in the form of

images, videos and text messages, which were randomly presented on the large screen in a semi-artistic fashion. Staff members could use such a mechanism to support a broad range of activities from making announcements of personal or academic achievements, through showing holiday or conference pictures to displaying funny or expressive images to evoke certain experiences in each other. At the same time, Panorama can also capture images and videos from the public spaces of a department and represent them in an abstract way by making sure it does not invade staff members' privacy. Although the kind of interaction that was supported by Panorama was mainly one sided – mainly from the technology to staff members, Panorama attempted to provide support for reflecting on staff members' lives, both individually and as colleagues.

The design of Panorama was intentionally sensitive to make visible the social and experiential aspects of staff members' activities in the department as well as outside the department. This brought the normal background of staff members' social lives to the foreground, and pushed task focused activities of everyday work to the background. Instead of focusing on tasks, we created a system that functions as a social entity in the workplace and as an alternative view of work life. Panorama strives to create a curious and experiential environment by providing a semi-artistic and engaging window into the social life of staff members. In that sense, it attempts to create a sense of continuous presence of staff members and becomes a resource for conversation and contemplation on the rhythms and routines of the workplace. Our two-week long field trial of Panorama showed how it stimulated curiosity, initiated conversations and activities during lunch hours in the staffroom. Staff members also gained knowledge about their colleagues and ongoing departmental activities and were able to cherish old memories from previous group outings and social gatherings. Reactions of the staff members of the department about Panorama were overall positive. People enjoyed seeing both current and former colleagues at events organized by the department, and personal content such as holiday, hobby and marriage pictures, as well. It proved to be a great source of new knowledge about colleagues for both newcomers and people who were well-known to the department.

The placement of Panorama allowed staff members to carry out their routine activities unobtrusively. During lunch hours, when a few staff members sat down in the Rappa for lunch, Panorama became a source and a trigger for conversations. And at times, it was not in staff members' focus. We believe that this really added value to the quality of Panorama. The serendipity of images and videos and the variety of topics that were covered by them played an important role in supporting staff members' conversations during lunch hours. It also provided an interpretive flexibility during the interactions with Panorama. Recently, the field of HCI has witnessed evaluation approaches that use users' interpretations as the basis (e.g. [15, 7, 9, 11]) During our field trial of Panorama, we collected a large set of staff members' interpretations about their colleagues, their social status, their non-work activities, among other things.

A lot of research on designing playful systems is seen in the domestic environments [10, 14]. A kind of play that was initiated by Panorama in the context of workplaces is also worth a discussion. The way Panorama represented information in a random and continuous fashion added to staff members' entertainment and enjoyment. Additionally, the contents of the Panorama became a trigger for poking fun at each other. As we

saw in one of the examples, pictures of an unusual pose from a staff member (referred to as ‘drugged’) initiated funny conversations between staff members. Similarly, staff members were also able to reminisce about their colleagues and past activities by viewing the contents of Panorama. Playfulness and affectivity were important properties of Panorama that supported social awareness among staff members.

6. CONCLUSION

Since the industrial revolution, ‘work’ is seen as vastly different from ‘play’, as the praise for efficiency and rationalization has increased [8, 23]. However, play and other non-instrumental aspects such as social awareness can prove to be important in work organizations. Awareness within work environments may not be seen limited to work-related information, activities and relationships. Mediating somewhat casual and engaging encounters related to non-work issues could also lead to meaningful, pleasurable and ultimately productive experiences.

Rogers [13] notes, “*we should also be designing [technology] to be exciting, stimulating and even provocative causing us to reflect upon and think about our interactions with them.*” Our work has contributed to an emerging domain for awareness technology, designed for the deeply experiential parts of human life, and not just for a particular task. Panorama is a large screen display that was situated in a publicly accessible area of the department – staffroom. It attempts to mediate cues of social awareness through visual information. It is meant to enhance social awareness in a playful way by displaying non-critical and non-work related information related to coworkers.

Panorama provides a window into the unexamined background of sociality of workplaces, and novel perspectives on workplace rhythms and tasks. The field trials of Panorama showed how it generated curiosity in staff members, helped members learn new things about their department and colleagues, initiated new conversations, and allowed members to cherish old memories.

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