

Iris: supporting workplace awareness by triggering informal interactions with visual material

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Abstract. Iris is a groupware-environment that was developed for the purpose of helping people to explore social interactions in the workspace. We designed Iris with the intent of creating a pleasurable experience by letting people communicate with each other with visual material while keeping the interaction possibilities simple, free and fun, in order to get people to experiment with it. We were interested in the way people would use Iris, their experiences with it, as well as the implications Iris would have on a community. Through observations and interviews we will show that participants used Iris mainly for setting visual triggers, in order to engage themselves and others in informal interactions. We conclude by presenting what relevance Iris and its interactions have within the workplace.

1 Introduction

Creative professionals are struggling these days. On the one hand, the computer enables them to create things they couldn't dream of before and to communicate in new ways. On the other hand, we lost a few things in the process as well. Because much of the creative work being done is made on computers, it often stays in there.

A shared overview of what's happening in the workspace, whether it be work, talk or people's presence, easily facilitates communication and other joint efforts (see Fig. 1). Unfortunately, the lack hereof by staying inside the computer, has led to creative professionals are missing some of the means for inspiration and learning opportunities. One might even argue that we are living together alone and should do away with shared workspaces altogether.



Fig. 1. The design studio before the introduction of the computer

In this project we will explore a different use of the computer, by returning some of those means for inspiration and communication. The field of Computer Supported Collaborative Work is currently looking into supporting workplace awareness and Communities of Practice, but yielded, with some exceptions, [5], [7], [11] either crude or passive systems and interfaces in our opinion [3], [8], [15], [17]. We believe this should be accomplished by binding people to one another and workspace using low threshold, open, pleasurable, free and ludic means. [6], [12]

For this purpose, we created a groupware environment, where people may interact with each other by using digital analogs of refrigerator magnets and sticky notes. The groupware environment, or Iris as we called it after the messenger of the gods in Greek mythology, is composed out of three components; a widget for use on the computer, a robot called Arthur and the Sticky Board. We tested this, by living and working with it, at the ID-StudioLab over a five-week period with 23 people. The ID-StudioLab is a research group composed of people designing as well as doing research on design, situated at the faculty of Industrial Design Engineering, Delft University of Technology. In this paper we give an overview of the background of this project in Calm Technology, describe the Iris environment and report our experiences with its pleasurable interface.

2 Communities of Practice

Designers often work in firms, often collaborating on projects within teams. The employees share a number of things: interests, goals, expertise, location and timeframe. In other words, they belong to a community of practice. Wenger [20] gives three characteristics for a Community of Practice (CoP):

1. The domain: a CoP's identity is defined by a shared domain of interest, requiring its member's to have commitment and certain competences relevant to the domain. In the case of designers the domain is design and their competences are one or more relevant to design, like drawing or modeling.
2. The community: Within a CoP members engage themselves in joint activities and discussions, help each other and share information, helping to build relationships from which people can learn from each other. Within a design firm, the employees often work together on a daily basis, therefore seeing and speaking each other on a regular basis. They may participate in workshops, brainstorm sessions, help each other, engage in casual conversations at the coffee machine or go out at night together.
3. The practice: member's of CoPs share knowledge and resources, like experiences, stories, tools and ways of dealing with problems. A designer working on a presentation might ask a colleague how something works in Photoshop for example.

Communities of Practice were not invented in the twentieth century; they've been around for as long as humans. The difference is that they were properly described in the twentieth century. Communities of Practice can be either formal or informal and are formed for the purpose of doing things together and to learn from each other. In more formal environments, CoPs also have the purpose of knowledge management. New members often join at the periphery of the CoP and slowly become core members as they learn.

3 Supporting communities and CSCW

Some work in CSCW focuses on supporting awareness in workspaces. The workspace may be the design firm's building(s) and the studios and offices therein. To understand this we must know what is meant by awareness in the context of workspaces and what the relevance is to the workspace. Essentially the workspace is the environment occupied by the community of practice in question. Awareness in CSCW research includes the ability of having a basic understanding and notion of who's around at a given moment, where they are and what activities and events are taking place. Being aware of what it is people are working on is also a part of awareness and is especially important in teamwork. To put it simply, awareness is the ability to maintain a connection to the environment, socially and physically. Learning is one of the key elements in research on Communities of Practice and deals mainly with the characteristic of community mentioned by Wenger. Supporting awareness in the workspace may thus be seen as a means of supporting Communities of Practice,

but research on the latter is only sparingly mentioned in CSCW research on workspace awareness for some reason.

During early nineties, CSCW adopted research on supporting awareness in the working environment in addition to supporting collaborative efforts. Early research focused mainly on what type of technologies could be used for supporting workplace awareness. Experiments were conducted using chat, instant messaging, bulletin boards and so on, or even digital environments were created consisting of two or more technologies. Later on, attention shifted towards what media could be used and later still, towards how groupware, focusing on awareness, should be designed. On computers it became popular to use so-called widgets, which are basically unobtrusive applications. [9] Inspired by Calm Technology [18, [19] the other approach is mostly known as peripheral awareness and was first proposed by Brown and Duguid. [4] It should be noted that periphery in the context of CoPs is not the same as periphery in the context of Calm Technology.

Calm Technology is about how information should be offered, when designing technology that doesn't necessarily need all of our attention all of the time. Weiser and Brown propose that, through filling the periphery, we're able to attune ourselves to our surroundings, without directing our attention to it. When changes occur within the periphery, we have the option to point our attention to it. This is the way people have been dealing with their natural surroundings for ages, but technology has to be designed to work like this in our perception. Without doing this we are at risk of overloading ourselves with information, demanding our attention. Brown and Duguid propose that being peripherally aware of the workspace and the people therein is essential to keep people interacting with one another. [4]

4 Approach in designing an environment for peripheral awareness

So if designers tend to participate within communities of practice, where the sharing of relevant resources is important and this tends to be hampered by the fact that it's difficult to get things out of their computers, what to do about it? First, let's take a look on how designers communicate with one another. When faced with a problem and seeking for help, designers tend to show what they're working on and tend to tell a story around what their showing. In other words, they tend to communicate on a more visual level. This approach has a low threshold and groupware in this context should reflect this. [16]

Because we're aiming for peripheral awareness, the groupware should be simple and should be able to reside in the corner of the eye. A small widget on the computer screen, providing only a basic overview of people, activity and communication is therefore preferable and won't compete with work people are doing on their computers.

In terms of functionality, the widget should not attempt to compete with the way people are working. It should not be a substitute for face-to-face communication, but provoke it if possible. Nor should it compete with the tools designers are already using, whether it is instant messaging for communication or Photoshop for their designs.

We believe that merely having a widget or tool on the computer is not enough. We state that a large portion of a designer's activities take place on the computer these days, but certainly not all. The working space of a designer, or any professional for that matter, should be diminished to the computer; the computer should serve as an extension to that working space. In the case of designers, the physical objects like tools, drawings and models play a significant role in facilitating communication.

To summarize, we wanted to provide people with a groupware environment consisting of a small, minimalist and aesthetic widget. The widget should provide a basic overview of the community and its people and allow simple and ludic ways of communicating with one another. For the latter we wanted to make it possible for users to share visual material from their own computer screens onto a collage. Having the collage visible on a public display should complement this. Finally, we thought we needed a means of adding images of physical things as well. For this purpose we wanted a camera sporting playful interaction.

5 Iris, an overview

The considerations above brought us to develop a groupware-toolset, called Iris. Iris allows users to create sticky notes resembling Polaroid™ photos with a picture and a tagline. Iris is implemented along a client-server model using Macromedia Director and the Macromedia Shockwave Multiuser Server, consisting of four components (see Fig. 2):

1. A widget on everyone's computer for monitoring activity and for simple visual interaction between other users and the Sticky Board
2. The Sticky Board, a shared whiteboard, meant for large displays.
3. Arthur, a robot built from Lego Mindstorms, for playful interaction and taking pictures of physical objects
4. And finally a server for managing network messaging and keeping track of activity levels.



Fig. 2. From left to right: the widget (back in magnifying mode, top as normal), Arthur and the Sticky Board

5.1 The widget

The widget in its normal state shows a visualization of activity of all users connected to Iris in the upper half as well as the six last pictures from the Sticky Board in the lower half. Users' activity is measured by the widget by counting keystrokes and calculating mouse speed. A user's activity level slowly diminishes over time, while not using their computer. This activity is collected by the server and sent back to all users. Users are able to get more info by holding the mouse cursor over the activity-visualization, revealing all the names of everyone connected to Iris. They can pick their own screen name within the widget. Holding the mouse over one of the six pictures in the lower half shows the tagline that was added when the sticky note was created. These pictures are tiny, so a feature was added, enabling people to grab a picture and rotate or scale them. Also, users are able to change the timescale of the visualization, enabling the progress of activity over the hour, the day, or the week. Users are able to view the Sticky Board from their widget as well. The button in the center, resembling an aperture, changes the widget into a magnifying glass, allowing the user to frame anything on their screen for the purpose of creating their sticky note. When done framing, the widget opens up the Sticky Board, with the sticky note attached to the user's mouse, allowing it to be placed anywhere he or she likes. Underneath the picture it shows the user's name, with space to add a comment as well.

5.2 Sticky Board

The Sticky Board is a shared whiteboard, where all of the sticky notes created by the users of Iris are located. The Sticky Board basically is a collage of Polaroid photos. With each newly created sticky note, the older ones fade away, giving a sense of history. Ideally the Sticky Board should be visible on one or more large displays in the workspace, to serve as an extension of the walls. This is easily perceivable, but not distracting and allows people to put the things on the computer easily on the wall. In other words, the Sticky Board is present, but mainly in the corner of the eye.

5.3 Arthur

Arthur started out as a hobby project, aiming to create a robot pet that was curious about its environment. During development, we decided to give Arthur a place within Iris. Arthur was inspired by Hektor; a robot capable of painting large vertical surfaces. [10] Similar to Hektor, Arthur hangs from the ceiling by two strings, allowing it to move vertically as well as horizontally, expressing the activity of all Iris-users. For input, Arthur uses a webcam, for both motion detection as well as taking pictures. The camera can rotate in the horizontal plane tracking motion. By holding something like an object in front of Arthur and framing it, Arthur will create its own sticky note at a random position on the border of the Sticky Board, subscribing it with its own name and adding a random comment. Arthur was built to be a playful and curious character, for the purpose of taking pictures of physical things, which can't be made by using the widget. Like large displays showing the Sticky Board, Arthur is another manifestation within the workspace.

6 Iris in a Community of Practice...

We tested Iris within our own workspace, the ID-StudioLab. The ID-StudioLab is a multidisciplinary group of people consisting of research, teaching and support staff. The work being done focuses on design and research, with emphases on aesthetics, design techniques and experience. [13] The ID-StudioLab is very much a Community of Practice.

Essentially the workspace is essentially divided into two main locations (see Fig. 3 for a schematic overview). The heart of the first location is a studio, housing up to 16 people. In this space we used the TRI-setup [11] serving as a large display for the Sticky Board. Around are a few smaller studios, meant for workshops, prototype building, meetings and presentations. The last room houses two people doing supportive work. The second part is located one floor up and consists of a hallway split in two halves, of which the furthest part is one of the quietest parts of the building. On either side of the corridor there are offices, housing one to three people. We put up Arthur in the public walkway to attract the attention of passers-by. The walkway is between both floors, with Arthur hanging behind a glass wall in order to protect it from vandalism and theft. (see Fig. 4.)

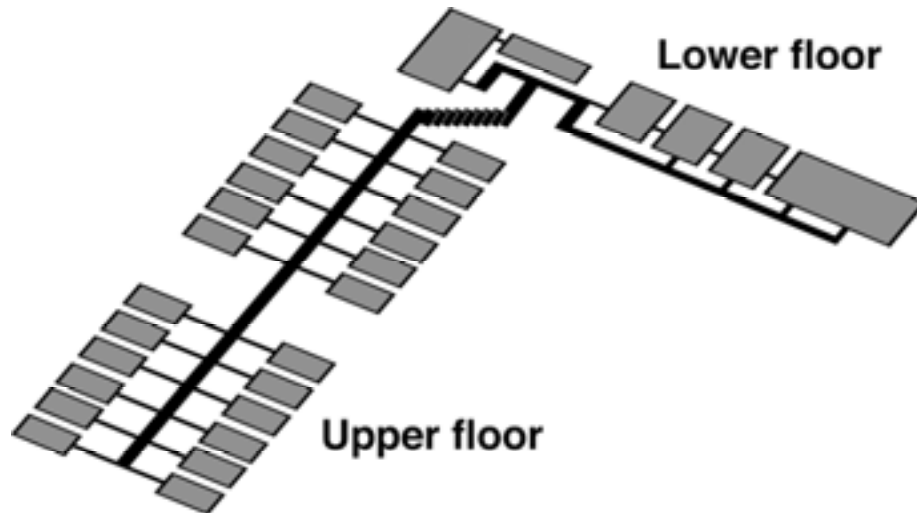


Fig. 3. Schematic overview of the ID-StudioLab workspace

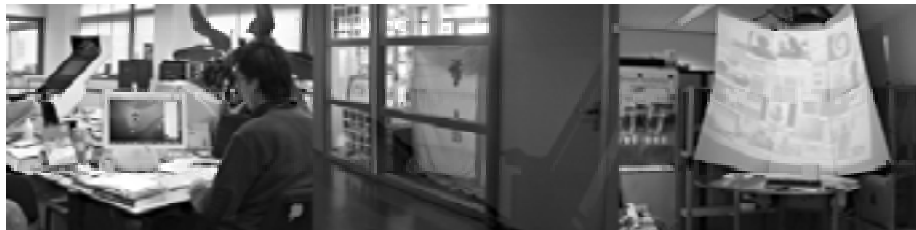


Fig. 4. Iris in real life: the widget on a computer, Arthur in the hallway and the StickyBoard on the TRI-setup

We wanted to know for which purpose(s) people would use Iris, how they would experience it and what effects it would have on the users. At the beginning of the experiment we made the widget available for download on our website. We gave no instructions as to what subjects the communications should encompass, so people could experiment freely. During the experiment logs of the number of sticky notes created were kept and the state of the Sticky Board was saved every 15 minutes if a new post had been made. At the end of the five weeks, we did semi-structured interviews with the participants. We asked them what they could tell about Iris, how they had experienced it and what they felt the added value of Iris was.

7 Observations

Over the entire period we observed a potpourri of subjects and interactions. Participants were experimenting, exploring the limits of Iris, teasing and provoking, making

announcements and asking for help or information. They tried to show things from their work, occupations and interests, but mainly dealt with play, humor, greetings, the weather, spare-time, things happening in the workspace and pleasing images in general.

7.1 Iris evolving over time

The first week mostly showed many loose postings without follow-ups, which some described as noise. We observed a general lack of tone and observed little interactions between users; there were hardly any follow-ups on posted sticky notes and attempts to communicate around a (work-related) theme failed to attract follow-ups. There were two exceptions; an aesthetic attempt to create a Droste-effect (Fig. 5) and the creation of a single picture composed of multiple sticky notes (Fig. 6). One person, who was continuously showing his affection for a certain celebrity, also raised the noise-factor to many participants. However, he stopped using Iris altogether after two weeks, mainly due to the fact that people we're showing their annoyance with it; both using Iris and in face-to-face talk.



Fig. 5. Droste-effect top-center, created using Iris



Fig. 6. Banner of people, composed of multiple sticky notes

During the second week we could observe the first themes and interactions. Greetings in the morning and goodbyes in the afternoon were getting responses. A few people attempted to create a weblog about interesting or funny websites and about gadgets. Web-addresses were often entered in the comment-field. These posts almost never received follow-ups (Fig. 8) and, with some exception to the gadgets, didn't generate any talk within the workspace.



Fig. 8. Loose sticky notes

After two weeks we saw people trying to socialize Iris. At one time, one of the authors shaved his head during the weekend and minutes after entering the large studio on the lower floor, the first comment had been posted. As a tease, someone created a sticky note, showing the upper half of a celebrity's head, asking whom it was. This resulted in a spree joined by four people, creating a joint quiz of "guess the bald head". Although only people from the large studio joined in, people from other locations commented on it during ad-hoc conversations and lunch. Two days later, a yawning kitten on the Sticky Board, resulted in another spree. Perhaps because spring had started, we observed the Sticky Board filled with pictures of all kinds of (young) animals. Remarkably someone commented on the fact that two other participants had obfuscated their names on Iris in such a way that she could no longer relate them to anyone; she was quite annoyed by this. The last day of the week was the first sunny day of the year, with people commenting on the weather. One person, who is researching products and sounds, commented by showing songs from her music library, having to do with the sun. Others reacted in the same manner.



Fig. 9. A collage of young animals on the Sticky Board

During week four and five, the last two weeks of this trial, themes and topics were stabilizing. People started reacting on a more personal level and we're specifically looking for subjects that would interest others. A core group of four people were setting the tone, repeatedly reacting to one another, often dealing with small talk, like when someone had changed his screen name to a Japanese version. We observed people showing off specific gadgets, Lego and their new nicknames for iTunes [1] music sharing. Also two were discussing their homework for a statistics course they were doing together.



Fig. 10. People showing their nicknames for iTunes music-sharing to each other

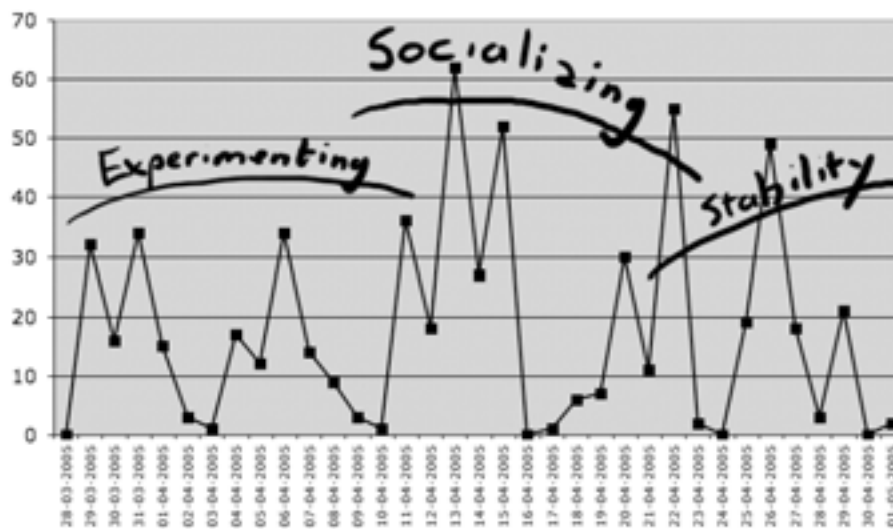


Fig. 11. Postings per day and phases of use

Of all posted sticky notes created during the experiment, logs show that four people, including one of the authors, are responsible for half of posted sticky notes and eight people were responsible for three quarters of postings (see Fig. 12). Out of these eight people, three were situated on the upper floor and one from the lower floor only worked for two days a week at the ID-StudioLab. The other three days, he worked at home and used Iris, despite the effort required to connect to the university network. The people belonging to the group responsible for setting the tone on Iris were all part of the top eight posting people as well.

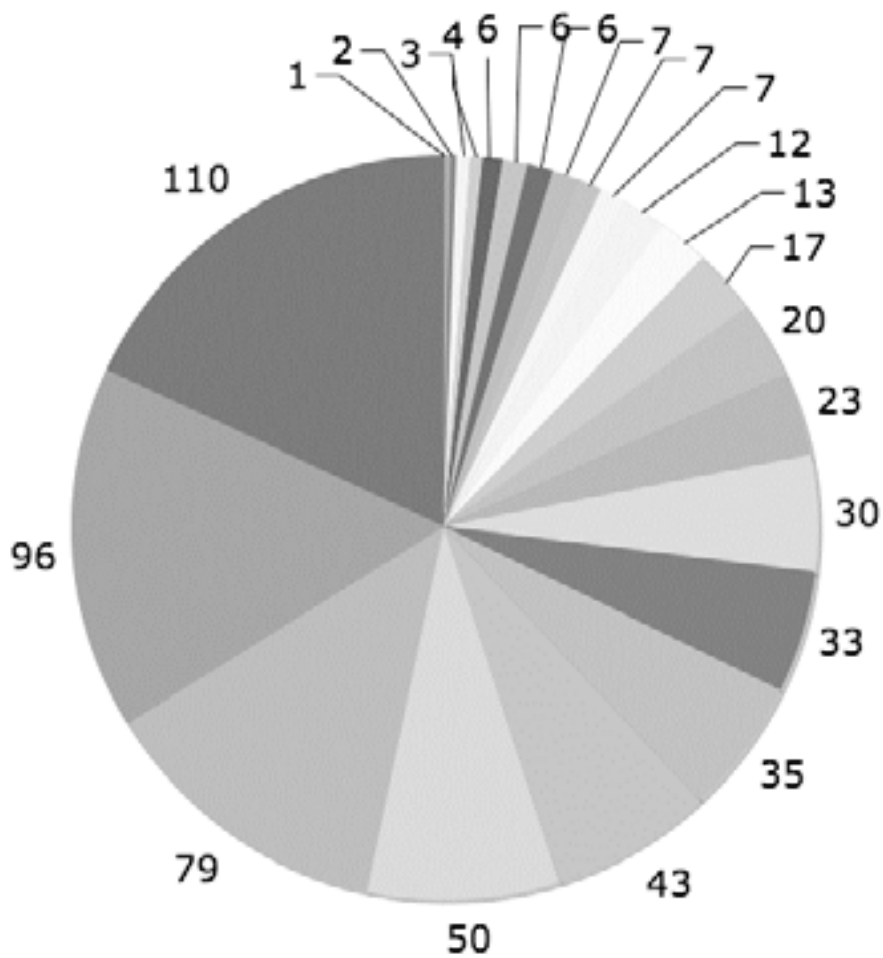


Fig. 12. Postings per participant

7.2 Participants' reactions

When we asked people what they thought about Iris we got mostly positive reactions. Most found Iris to be aesthetically pleasing and fun to use as well as having had a pleasant experience in communicating with each other. Three of the participants were negative. One had expected Iris to be used for sharing more work-related content, whereas another found it to be too cognitively challenging. The last participant found the idea of communicating to be apprehensive, because she feels we're doing far too much with computers today.

Some commented on the fact that it was a new way in communicating with one another. Most described it as play, fun and humor. Especially the people, who posted more, said they and others used it for teasing, provoking and finding the limits. One participant noted: "As long as it was witty, it was okay". However, a few pointed out that this sometimes annoyed them, because it sometimes led to pointless noise. Especially posting a sticky note over one that had been made moments earlier was reported to be irritating. On the other hand, what was noise to some, was fun and engaging to others.

Initially some tried to show work-related material, but noted that they couldn't "fit" it inside a small picture and a tagline. Many also commented that they couldn't understand most work-related sticky notes. This was also shown by the fact that these almost never received follow-ups. Some opted either for the option of adding more text than a single tagline or the option of adding hyperlinks to the sticky notes. People who had thought this through, however, noted the possibility that this might lead to everyone adding hyperlinks, causing the Sticky Board to be nothing more than a visual collection of hyperlinks, without the interactions between people.

When asked what the added value of Iris was, all remarked that it was mainly social. The activity-visualizations had nothing to do with this though, only having used them, checking if activity was rated high if large numbers of posts had been made. Five reported to use Iris often as a means to escape from work for a moment. They said they toyed with the basic widget, rotating the list of names and rotating and scaling the array of photos, but mainly checking up on what had been posted and creating sticky notes of their own. Especially the people who posted often liked the ability to have a little chitchat and some compared the tone of the Sticky Board to "bartalk". Although some checked the list of names to see who was present, they noted that this had only little meaning to them; it didn't tell whether someone was at his or her desk.

Participants were able to recollect five to ten names, when asked who had been participating in the experiment. They noted that this was mainly because of the posts that had been made, or as one participant remarked: "If you post, you exist". It's interesting to note that only participants on the upper floor, who have offices, experienced Iris as bonding. They liked the fact that things happening in the large studio, which is often regarded as the heart of the ID-StudioLab, found their way to their personal workspace, even if they had been more passive users. Some noted that they were annoyed when they couldn't relate sticky notes to a person, due to people using

names, meaningless to some. One person remarked that this influenced the quality of interactions on the Sticky Board in a negative way. This emphasizes the social function of Iris within the community.

Although some used Iris just to show a single nice looking image, most created their sticky notes with the intent of getting reactions, checking if someone had posted a follow-up during the first few moments after posting. While not disappointed when they hadn't received any reactions, whether it was using Iris or face-to-face, all mentioned they appreciated it when they had. Within the large studio, people often used the sticky notes as triggers for short face-to-face conversations. But also people reported commenting on people's posts as they ran into each other in the hallway or during lunch. One participant, who had started a discussion about shopping and shoes, in reaction to "the boys" always talking about gadgets, told she continued talking about it face-to face at the end of the day.

Three remarked that when they had gone home early or been away for a day, they were surprised how many posts had been made. One of the participants, who comes in early and leaves early, said: "I always noticed how much always happened in the hour after I left. Sometimes I saw it (the Sticky Board) had completely changed and I thought, wow, a lot has happened". They and others would have like the ability to back into time because of this.

We asked what Iris was and surprisingly everyone regarded the widget on his or her computer screens as Iris, not the entire system. The presence of the Sticky Board on the TRI-setup was mostly not observed, but this may have to do with the fact that it is used for other applications as well, like presentations and music. Arthur was regarded as a mixed bag. As a utility, most people saw Arthur as being flawed, mainly because of its awkward interface and its location. A few people, especially those who mentioned Arthur as being a participant, thought Arthur did have an added value. They appreciated how Arthur reacted to them and allowed for physical play and told Arthur gave Iris a presence outside of the computer. Most would walk by one or twice a day, reminding them of Iris' presence in the community and triggering interest in the processes happening there.

8 Discussion

We feel Iris and the trial have been a success. We had expected more communication on what people we're working on. We could contribute this to the fact that the majority of the work people are doing at the ID-StudioLab is not purely visual, in contrast to a designers' daily work. However, we think the low level of work-related postings is mainly due to the fact that creative people tend to be playful and the fact that Iris facilitates this so easily.

Without making Iris playful, simple and restricting it, conversations most likely wouldn't have been so personal. A more formal approach would probably have led to

people not committing to Iris by setting on a tone, resulting in much less communication and not having the wealth of information we have now. Other than hyperlinking and an ability to go back in time, participants didn't feel they were missing anything. In fact, we believe that had we added more functionality and sacrificed some of its minimalism, like adding personal messaging for example, Iris would be competing with instant messaging and people wouldn't have been able to address a purpose to Iris. While Iris one could easily compare Iris to instant messaging, the fact that messages we're public and visually oriented made for different types of conversation.

We were able to make the widget stand out, by setting it apart from other things happening on the screen, aesthetically and in terms of size. This probably contributed to the fact that when talking about Iris, people we're actually talking about the widget. By being small, the widget doesn't interfere with what people are doing. Almost none minimized Iris during use and kept it in a corner of their screen the entire time. Those that did minimize it, we're all Microsoft Windows users; Mac OS X users probably found having it open no problem, due to OS X's Exposé window management functionality. It's remarkable to see how popular the use of widgets has become, since the introduction of the Dashboard under Mac OS X 10.4. [2]

Some of Iris's aspects need some work however. The activity visualizations, while pleasing to the eye, could probably be discarded. The fact that the Sticky Board was on display wasn't noted by most. For this to work it probably needs a dedicated display, which doesn't interfere with other functions like serving as a jukebox as well as some interactivity. This conflict didn't come as a surprise, but since it was the most appropriate display available, we decided to use it anyway. Arthur needs to be less awkward to work effectively for most, only few were able to deal with its quirks. Also, a better location would be preferable. Iris was built as an open system and is still a work in progress. Derivations are likely to be made, as well as new types of input, like cameraphones for example.

9 Conclusion

Iris allowed people to explore new ways of communicating, finding form and purpose in the process. While Iris didn't allow for work-related discussions, people found a way to interact with one another. One third of participants committed themselves to Iris and the purpose it served within the community. The tone was set by only a sixth of participants, having others follow. Out of a need of informal social interactions, after experimenting the first two weeks, they used Iris for teasing and provoking reactions, socializing the workplace.

Especially for participants on the upper floor, who are not surrounded by a large group of people, Iris had a bonding effect and gave them a feeling of presence of the people surrounding them. This is not to say that Iris served no purpose in the large studio on the lower floor. Setting visual triggers often sparked people's curiosity and appealed to their playful nature, providing a means to engage in face-to-face conver-

sations at their desks or in the hallway. Iris helped people to find common interests in each other, whether it is play, gadgets or shopping.

By knowing what interests others in the workspace we can easily interact with one another and engage ourselves in conversations and discussions. In informal and casual conversations we can freely associate further. We can relate this to the work we're doing and hereby learn from each other. For this to arise we need something to talk about in the first place. Iris helped to give the handles needed to spark people's curiosity and imagination. Without form, though, this wouldn't have happened either, requiring a few people committing themselves, inspiring others to follow.

Results from other studies, incorporating groupware focusing on peripheral awareness and using lightweight and unobtrusive interfaces seem to provide similar results. As with Iris, users of Portholes [5] we're able to recollect events and reported feelings of social bonding. The fact that Portholes has an emphasis, similar to Iris, may contribute to the similarity in results. From AROMA [14] we may conclude that (abstract) visualizations may actually serve a purpose in supporting peripheral awareness. Although, AROMA's visualizations weren't perfect, they sparked far more interest than Iris' visualizations. However, we feel that abstract visualizations will be overshadowed by the dominant nature of the visual triggers and should therefore be omitted.

We feel that we returned something to workplace that has been lost since the introduction of the computer. Although not the creative work we initially aimed for, we found out we were able to provide people with a toolset that has been successful in creating a pleasurable experience and providing a means of sharing the handles people need to engage themselves in informal and casual interactions. People need to have a shared overview of these interactions if they are to connect and bond to one another. We also believe these interactions are necessary when a community wants to be able to commit itself to a common cause and become more than just the sum of its members.

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