

Awareness issues

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Abstract

How to achieve non-intrusive awareness about other people, activities and artifacts is at the centre of CSCW research. In this paper I explore the concepts of awareness, social awareness and workspace awareness. I describe some important awareness requirements and evaluate three applications, MSN Messenger, It's learning and Viras according to these requirements. A brief comparison of the three systems is given.

1. Introduction

When a person is working alone not affected by others, the whole effort will be productive work. However, the situation is often not like this. People who are dependant on eachother, will also have to spend time coordinating, monitoring each other's work, keeping up to date of each other's plans etc.

The field of CSCW is concerned with how computers can support such interdependencies among people. Coordination and awareness are two important concepts in this field.

Coordination refers to the active planning and scheduling of tasks between people. Awareness is a less intrusive way of surveiling other people, their roles and activities.

In a co-located setting, we get a lot of information about the other people and their activities by asking simple questions or just by being present in the same place. We can take a glance at what they are doing, see what kind of mood they are in, interpret what they are saying in light of their body language and so on. In a distributed setting we lose much of this information. To make up for this, there is a need for computer systems to provide such awareness.

Providing awareness is not just needed in a work setting. Students using learning management systems have similar needs. Awareness of other people's presence is important in every situation where you might want to contact a person and/or have a chat with one.

In the second section of this paper, I will look at different types and definitions of awareness. Section three treats important requirements for different types of awareness. Section four presents three applications and shows how these deal with the awareness requirements. A brief discussion is given in section five.

2. Awareness types and definitions

Many types of awareness are described in the literature. I will present and evaluate some of them here, and show what types of awareness I will discuss in this paper.

Nunnari & Simone (2004) describes awareness as the “practices through which competent actors continually and apparently effortlessly align their activities with those of their colleagues, while engaged in and without interrupting ongoing local activities.”

This definition shows important aspects of awareness, but it is a very generic and only presents an ideal situation.

Dourish & Bellotti (1992) describes awareness as “an understanding of the activities of others, which provides a context for your own activity”. The sole focus on activities makes this a very narrow use of the term awareness, and seems to be best suited for groupwork in relatively small groups where the actors already know each other. People’s roles is for instance not included in this definition.

Convertino et al. (2004) uses the term activity awareness. They see this as a special type of awareness and define it as people’s ability to get and maintain “the big picture” about the ongoing collaboration while they are working together on long-term projects. They may use the term activity somewhat differently from Dourish & Bellotti (1992), since they only focus on “the big picture”.

Social awareness in another type of awareness. Praslova-Førland & Divitini (2003) defines social awareness as “awareness of the social situation in a group or community in a shared environment, which can be physical, virtual or both: people’s roles, activities, positions, status, responsibilities, social connections and group processes, with a time-span from a short term overview of the social situation of a community, to a long-term memory of a community’s social life.”

Workspace awareness is described as “the understanding of who is in the workspace, where they are working and what they are doing.” (Gutwin & Greenberg, 1999). This description seems to only be concerned with people and thereby lacks the awareness of the state of artifacts. In another article by Gutwin & Greenberg (1996) they define as workspace awareness “the collection of up-to-the minute knowledge a person uses to capture another’s interaction with the workspace”.

To elaborate the definition somewhat, I will in this paper define workspace awareness as “updated information about other people’s presence, location and activities and about the state of tasks and artifacts in the workspace”.

Information about future events and plans is seen as coordination, and is therefore not treated in this paper. The main distinction I will look at is the one between social awareness and workspace awareness.

3. Awareness requirements

Co-located awareness is often used as a model (Erickson & Kellogg, 2000) of what to try to achieve in a computer system. This may provide some useful guidelines, especially for social awareness. For workspace awareness, a computer system may also provide awareness beyond what is picked up when co-located.

3.1. General requirements

When designing systems supporting awareness, it is important to have in mind some of the advantages compared to other systems. One advantage is the non-intrusive manner in which the information is gathered. The person who is being “watched”, does not have to spend resources answering or thinking about requests for information. Although this also raises serious privacy issues (Godefroid et al., 2000), it provides information quickly without bothering anyone. It is important that people know how others can get information about them and their activities.

Becoming aware of something is usually not the main activity. Design of systems should therefore allow for something else to be in focus, while the awareness information can be picked up without paying much attention to it. An important requirement is that as few resources as possible is spent becoming aware of something. Ideally the information should be immediately available, and ready to be picked up almost unconsciously

Another advantage is that the information is available even if the person who could provide the information is not. This is particularly important concerning awareness on the state of tasks and artifacts.

The need for awareness will vary according to what relation the people have to each other. Awareness needs for families and friends will differ from the needs of co-workers.

3.2. Social awareness

People with a social relation to each other will have a need for knowing what the person is doing at the moment. It is usually not that important to have information about past activities. The most important information one needs is probably about the presence of other people. This will establish whether it is possible to contact the person at the moment. It may also give information about the location of the person or what he/she is doing at the moment.

Presence information is also important in a setting for work or in a learning institution. This may apply to awareness on specific people or awareness on the presence of people that have some specific interest or knowledge. In addition it will be useful to know what roles and responsibilities people have in a group or a project.

3.3. Workspace awareness

When people are working interdependently in a common workspace, it is important to be aware of others' activities, since the work of one person may depend on the work of others. If you intend other people to review a document, it will be helpful to know if the document has been read and by whom. If more than one person are working on one document, it is obviously important to know if others are working on the same document at the moment. The document may be locked or versioned. Information about this may help in determining when the document will be available, and if it is ok to make changes

to parts of it. Awareness on past activities connected to documents may be very useful. Schmidt & Simone (2000) describes a situation where any changes an actor makes to a field of work will emit signals that other actors may perceive. This may also provide rudimentary awareness of the activities undertaken by colleagues (Schmidt & Simone, 2000).

There may also be a need to get information about the state of a task or a document even if the one seeking information is not involved in the actual work. The information seeker may have work that depend on input from the task, or he/she may be supervising the process.

4. Awareness solutions and applications

In this section, I will present three very different systems that provide awareness in different ways. I cannot provide an exhaustive description here, but aim at giving an overall view of the systems and discuss the most important awareness features.

4.1. MSN Messenger

Messenger is a program focusing on social awareness and communication.

The main awareness information is the presence of your contacts. Some of the possibilities are “online”, “busy”, “away” and “on the phone”. These states of presence are both shown as an icon to the left of the name and as text to the right of the name. Presence information can be set manually, and will change automatically from online to away if the person has been idle at the machine a while. It will change back to online if the user the user is active. Presence information is a crucial part of Messenger that makes it possible to see if someone is available for a chat.

The second important awareness feature is information on how many unread e-mails the user has. This is shown as text together with a letter icon and a link to the inbox. This feature can save quite a bit of time, since it makes it unnecessary to log onto web-based mail systems to check for new mail.

Messenger is designed to provide awareness without taking unnecessary attention from the user. The program window is pretty small, so it doesn't cover much of the screen. When the user is not actively using the system, he/she can close the window. The program is still running, and can be opened from a small icon on the bottom of the screen.

When the program is closed, but not exited, messages about new mail and contacts that have logged on is still presented. In these cases a small textbox appears for about five seconds, accompanied by a swish sound, and provides this information in the bottom right corner of the screen.

4.2. It's learning

It's learning is a learning management system. An important feature of the system is pages for each subject and each project. On the front page, you see the subjects and projects you are currently connected to, together with the last date that each subject/project has been edited. If a subject/project has been edited since the last time you visited it, the date is red instead of black. Another awareness feature on the front page is that you see a small picture of an unopened letter if you have new messages.

The subject and project pages has some immediate awareness on the main page for the subject/project. The remaining activities of the day and the week is visible. New elements since last time the person visited the page is shown. In addition there is a bulletin board, where one actively can provide information for others to see.

When looking at a file, much of the information about it is not immediately available, but a few mouseclicks away. It's learning uses some symbols to convey awareness information about files. A small image of a lock that is open or locked is for example used to show if a file is locked for editing. It does not, however show information on who locked the file and why it was locked. Other information that is connected to a file is the name of the creator, the version number and the time of the last editing of the file. All in all, the system has some useful workspace awareness, but much of it is not placed immediately available to the user.

Both the subject and project pages provide awareness on who is connected to it, and on the roles of each person. The different groups in a subject are also just a mouseclick away. In a project one can also see when the different project participants were logged in last. This gives the users a pretty good social awareness.

It's learning also has chat and calendar features, but to my experience these are in little use, so I do not discuss those here.

4.3. Viras

Viras is a collaborative virtual environment (CVE) for social awareness support in educational settings (Praslova-Førland & Divitini, 2003). The focus of such environments is to provide social awareness. Users of Viras are represented as avatars in the system. They may choose a figure to "play" and make adjustments to this. Different types of commands will make the avatar wave, walk, talk etc. This system resembles graphical roleplaying games. The virtual world is populated with different kinds of environments to give an indication of what activities that takes place at different places. The users can themselves extend the world building their own places either for individual or group use.

The avatar gives a physical awareness of people contrary to non-graphical systems. Waving, gesturing and other bodily conduct will give other users information on what the

person is trying to convey. This gestures of an avatar may, however, be very different from the ones of a real person, and only conveys the active and intentional actions of a user.

The environment in itself gives clues to what is happening. Libraries, boards with notes on it and houses are 3D representations of real-life constructions that should give the user some immediate understanding of what is going on at that place.

The awareness of such a system may be “alive” and fun. The saying goes that a picture tells more than a thousand words. Meeting people in Viras can give a more wholesome experience and provide a more thorough awareness of other people and the environment. One may receive many clues about group constitutions, roles and activities without focusing on it. People may deliberately provide awareness by putting up notices where they want others to see them or by making constructions that provides clues.

The system does not meet the requirement that it should take too much attention. Usually playing an avatar will take all the attention of a user. Learning the commands and getting to know the world is also overhead that may prevent people from using the system. The value of using the system is also affected by the number of other people in the system. The system must contain many users to provide interaction between people. If a group wants to collaborate in the system, the group members must make an appointment to go into the system at the same time. A last concern about CVEs is that the graphical quality is an important factor for providing users with a realistic experience, which in turn is important for conveying awareness.

Nunnari & Simone (2004) promotes 3D representations without forcing user embodiment in an avatar. “The design of an interface promoting awareness information has to balance a rich and timely provided content with the appropriate level of intrusion” (Nunnari & Simmone, 2004)

5. Discussion

To some degree, the systems are too different to give a meaningful comparison between them. I will however try to compare them by evaluating them according to the criteria given in section 3. Since It's learning is the only system that focus on workspace awareness, I will not give a further discussion on this here.

The attention needed to use the applications is very different. Viras takes all your attention, It's learning almost as much and Messenger is designed to take as little attention as possible. This does not necessarily mean that all this attention is spent on getting awareness information. It seems to me that the collection of awareness takes a large part of the resources in Viras while it is more in the background in It's learning.

Presence information is provided well in both Viras and Messenger. It is possible to see who is logged onto It's learning as well, but the awareness given in Viras and Messenger is more immediate and much richer.

Messenger does not provide information on a user's activities. The same applies for It's learning, with the exception of what one can infer from the activities done to the documents. In Viras one can see a 3D representation of other's activities. This applies, however only to the avatar, not the actual person.

Only Viras provides information on the location of a user. This also applies to the avatar only.

It's learning supports awareness on people's roles. The avatar may provide information on this in Viras. Messenger does not provide this information.

In conclusion, the different focus of the three systems makes them very different in how they present awareness information. Many of the same design requirements apply to all

the systems, but the way they balance the different awareness requirements against each other and against other factors differ greatly between the systems.

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