

Shared Desktop Media Item: The Video

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ABSTRACT

The Shared Desktop Media Item is an awareness tool that uses *screen sharing* to provide a distributed group with mutual awareness of artifacts and individual work. People see others' screens in miniature at the edge of their display, can selectively raise a larger view of that screen to get more detail, and can engage in remote pointing if desired. Through such 'artifact awareness', members of a distributed group can stay aware of what others are doing, monitor progress and coordinate joint tasks, determine when another person can be interrupted, and engage in serendipitous conversation and collaboration. 'Privacy' controls are included to limit what others can see.

Categories and Subject Descriptors

H.5.3 [Group and Organization Interfaces]: Computer supported cooperative work

General Terms: Design, Human Factors.

Keywords: Screen sharing, artifact awareness, distributed groupware.

1. INTRODUCTION

The Shared Desktop Media Item [7] is an awareness tool that lets members of a distributed group publicly display all or part of their current computer screen to others. Unlike normal screen-sharing systems, it is intended to support *artifact awareness* leading to opportunistic interaction in a distributed group with a strong desire to stay in up-to-the moment contact with each other. We believe that because the screen contents capture almost all of a person's digital activities, screen sharing is a critical component of distributed artifact awareness.

2. BACKGROUND

Casual interaction – the brief, unplanned meetings that commonly occur during the day between co-located people – has been shown to be important in everyday coordination and work [4, 8]. Casual interaction is made possible by *interpersonal awareness*, the understanding of who is around, what they are doing, and whether or not they are available for conversation and collaboration [4]. *Artifact awareness* – one person's knowledge of the artifacts and

tools that others are working with – is an important component of interpersonal awareness. For office workers, artifacts include the documents and drawings (both physical and digital) that people work on over the course of a day, the secondary materials that support their tasks, and the tools they use to carry out their work. Being aware of these artifacts is valuable for a variety of reasons, such as monitoring and coordinating activities, determining someone's availability, and creating serendipitous opportunities.

Interpersonal awareness is easy to maintain in a co-located setting, but casual interaction is problematic for distributed groups, due to the lack of awareness cues. Consequently, distributed collaborators must put a relatively large amount of effort into coordinating interaction (e.g., by scheduling meetings). This effort is a problem, because many opportunistic interactions would not occur if they had to be planned in advance [4], suggesting that distributed groups are missing out on valuable opportunities for collaboration. This partially explains the explosion of low-effort awareness servers and casual interaction systems, such as the widespread adoption of instant messengers by diverse user groups [6], or the use of media spaces to provide rich awareness through networks of audio and video [2, 3, 5].

Despite the availability of awareness servers and casual interaction systems, distributed groups still lack the easy awareness of others' artifacts that is normally found in a co-located shared environment [8]. While there are many groupware systems that let a distributed group share artifacts (e.g., shared editors), they work only *after* interaction is initiated. That is, they are intended for focused collaborative work rather than artifact awareness. Similarly, screen sharing systems – applications that let people explicitly share their computer screens, windows, or arbitrary screen regions with each other – are designed for focused interaction rather than artifact awareness leading to casual interaction. For distributed groups, there is still no real equivalent to the way that co-located people can visually share their individual work and maintain artifact awareness.

3. SHARED DESKTOP MEDIA ITEM

The Shared Desktop Media Item uses screen sharing to provide a distributed group with mutual awareness of artifacts and individual work. It was created to be used within the Community Bar (CB) [5], a media space that can be augmented with extra information (Figure 1a). This was done in order to take advantage of existing CB features, such as a group-based public display, an always-visible sidebar interface supporting transitions from peripheral awareness to interaction, and the provision of other communication and information channels within the CB, such as presence indicators, text communication, and so on. That is, we expect our Shared Desktop Media Item to work within the context

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CSCW'06, November 4-8, 2006, Banff, Alberta, Canada.

ACM ISBN #/06/011.

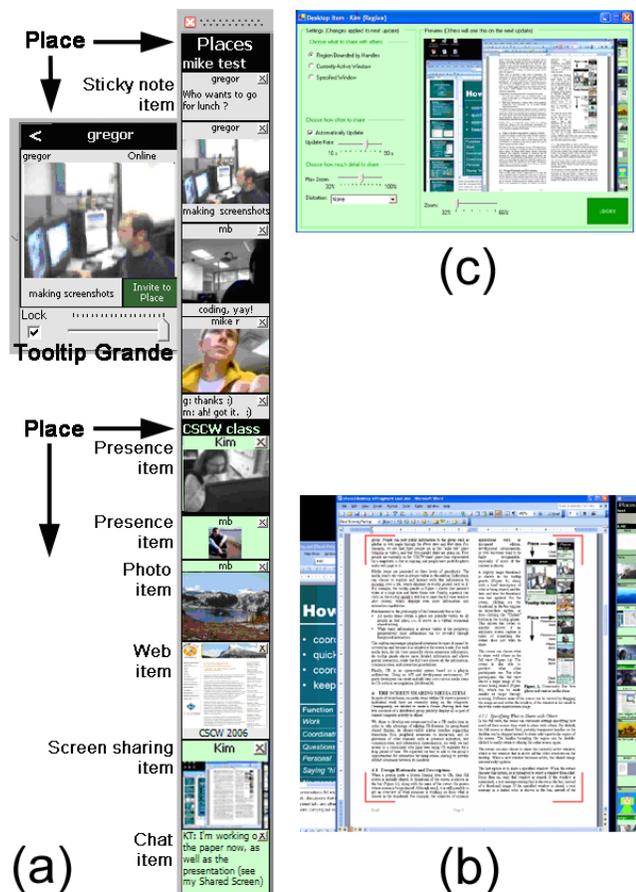


Figure 1 – Shared Desktop Media Item. (a) Community Bar; the *tile view* is 2nd from the bottom. (b) *Full view* for the person sharing their screen. (c) The region of the screen being captured is marked by adjustable semi-transparent red handles.

of other interpersonal awareness information and public conversations.

As a CB plug-in, the Shared Desktop Media Item is presented at three levels of granularity:

- *tile view*: always visible in the CB sidebar, it contains a thumbnail miniature of the screen being shared labeled with the person's name (Figure 1a, second from the bottom).
- *tooltip grande*: opened by mousing over the tile, it contains a larger thumbnail of the shared screen, additional information on what is being shown, and some interaction opportunities.
- *full view window*: a separate window opened through the tooltip grande, it contains more detailed information and additional interaction capabilities (Figure 1b).

The view and controls are similar on the tile and tooltip grande for all members of CB [5,7], but the full view window for people sharing their screens contains additional options for configuring what they want to share (Figure 1b). While basic information is always visible at the periphery, progressively more information can be revealed through focused interaction.

CB and its shared screen media item is akin to a shared office of close-knit workers that are comfortable with seeing each other as they move around the shared space, as well as any information they are working on. Of course, this intended use could be abused

by (say) an office manager that insists that all employees use the Shared Desktop Media Item so that their work can be monitored. However, even in the benign case, people may want some control over what others can see as well as feedback of when others are looking. The challenge is how people can balance the awareness information they want others to have of their work with their own privacy needs [1]. Privacy is heavily dependent on the group culture and the actual practice of use that develops over time. Consequently, the Shared Desktop Media Item offers various controls and feedback that people can use to balance awareness with privacy, including restricting what parts of the screen others can see (Figure 1c), specifying update frequency, hiding image detail, and getting feedback of when screenshots are taken.

4. FUTURE WORK

People inhabiting a common space naturally see the screens of their co-workers as they glance around, or walk by, or when they are invited in for side-by-side work. However, the notion of using a shared screen in distributed groupware for artifact awareness is an unusual concept. We recognize that such a use will likely have to develop over time as part of a group's everyday practice.

Consequently, we decided to introduce the Shared Desktop Media Item to our research group and collect their initial experiences and reaction to it. We saw that people used our tool for several purposes: to maintain awareness of what others are doing, to project a certain image of themselves, to monitor progress and coordinate joint tasks, to help determine when another person can be interrupted, and to engage in serendipitous conversation and collaboration [7].

Future directions include deploying the system to other groups and observing how they adopt it for their own use.

Acknowledgements. This research was partially funded by Alberta Ingenuity, NSERC NECTAR Research Networks, and our industrial partners: Smart Technologies Inc. and Microsoft.

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