

Exploring Awareness Needs and Information Display Preferences Between Coworkers

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ABSTRACT

Technology makes it possible to share many different types of information with coworkers. We conducted a large-scale survey (N=549) to better understand current sharing among coworkers, how people stay aware of collocated and remote coworkers, and whether their willingness to share different types of awareness information changes based on the location in which the information is displayed. Contrary to our expectations, the display location did not greatly affect what respondents were willing to share. Our results also suggest considerations for researchers building situated displays, as respondents had concerns about unintended viewers and encouraging people to visit their personal space when they were not present.

Author Keywords

Awareness, CSCW, Situated display, Privacy

ACM Classification Keywords

H.5.3 Group and Organization Interfaces — CSCW

INTRODUCTION

Have you ever been frustrated by finding a coworker's office empty with no indication when they will return? Do you find it hard to stay aware of what remote collaborators are working on? In recognition of the importance and challenge of staying aware of coworkers, many systems for supporting group and coworker awareness have been built and studied, e.g. [1, 2, 3, 5, 6]. To better understand the need for such information sharing methods across diverse job roles, office cultures, team sizes, and coworker locations, we conducted a broad survey into workers' perceived awareness needs and the types of information they would like to share when using various sharing methods. Our survey dealt with *what* information people want to share and *how* they wish to share that information.

The first section of the survey gathered data about respondents' work environments, how respondents stay aware of coworkers (both *collocated* and *remote*), and what

awareness information they currently share. The second section explored whether the location in which awareness information is displayed might affect the types of information people were willing to share. For example, you might share more detailed information on a display outside your office than on a website accessible to anyone in your company. The survey asked respondents about sharing information in four different locations: on a website and three situated display locations: their office door, a desktop screen saver, and at a remote coworker's site.

Most similar to our survey, Olson et al. [7] surveyed 30 respondents on their attitudes towards sharing 40 kinds of information with 19 categories of person (e.g. spouse, manager, etc.). Lederer et al. [4] studied the effects of the situations in which sharing might occur (e.g. a working lunch and a social evening), and with whom (spouse, employer, stranger, merchant). They conducted a survey of 130 people, and found both the inquirer and situation to be important determinants for sharing preference. Our survey differs from both of these by gathering data on current behavior and by exploring whether the display location affects what people are willing to share.

The results from our 549 respondents suggest that survey respondents do experience trouble staying aware of coworker's status, particularly remote ones. Contrary to our expectations, the location in which the information would be displayed did not greatly affect what participants reported being comfortable sharing.

SURVEY

We conducted a web-based survey using the Illume tool by DatStat in March 2008. The survey had a maximum of 174 questions, but since respondents were only asked questions relevant to their situation some respondents were presented a subset of those questions. Of 549 respondents, 475 reached the end of the survey in a median time of 25 minutes while the rest partially completed the survey. We report the number of respondents for each statistic. The anonymized data will be made available to other researchers by request.

We sent the survey to two groups: *externals* not employed by Microsoft, and *internals* employed by Microsoft. To distribute to externals, we sent a URL in an email to 2,000

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valid email addresses selected from Microsoft’s database of usability subjects. We selected for full time knowledge workers who work onsite and interact with a coworker at least once a week. These were split equally between residents of the United States and residents of other countries. We incentivized survey participation using a sweepstakes drawing with five prizes, each being an item of Microsoft software of the winner’s choice (maximum retail value US\$450 each). We received 241 valid external responses (12% response rate), where at least some of the questions were answered. For internals, we sent the survey to 1,500 Microsoft employees. We incentivized internal survey participation with a drawing for a single US\$500 gift certificate. We received 308 valid internal responses (21%).

Overall, most of our survey respondents were male (86%, N=549) and between 20 and 49 years of age (86%, N=549 Median age range=30-39). Most (82%, N=547) had worked more than 1 year at their company with the median length of service 1-5 years. As we had recruited for, respondents tended to be full time employees; the median response for hours worked per week was 40-50, with only 16% working fewer than 40 hours per week (N=549). Respondents spent most of their time at work using a computer: 89% (N=549) reported spending 75% or more of their working hours using a computer. The median response for size of company by external respondents was 100-999 (N=241) although 22% of people worked at companies with more than 10,000 employees. At the time of the survey, Microsoft had approximately 90,000 employees worldwide.

The biggest difference between internal and external respondents was their office configuration. More than half (55%, N=308) of internals had a private office compared to 28% (N=240) of external respondents. External respondents most often (30%) had open plan offices where they could see coworkers while seated. This is compared to only 5% of internals. Otherwise, there were few significant differences between responses from externals and internals.

AWARENESS AND INTERACTION WITH COWORKERS

We asked participants about how they interacted and shared awareness information with both collocated and remote coworkers. Collocated coworkers were defined as “*people who you work with and who you would visit in person (rather than by phone, email, or instant message) if you had an important question that was best resolved by immediately talking with your coworker.*” Remote coworkers were defined as “*coworkers that you work with on a project or need to interact with frequently, but who do not qualify as collocated coworkers. For these coworkers, you would typically phone, email or instant message them, rather than go to their desk if you have an important question for them. For example, they may be coworkers who are located on another floor, in another building, in another city, or in another time zone.*”

Respondents had more collocated than remote coworkers. The median response was “6-10” collocated coworkers

Question	Collocated (N>485)	Remote (N>379)	Sign test p< 0.001
1. It is easy to stay aware of [coworkers’] schedule and when they will be around	Agree	Neutral	z = -9.08
2. It is easy to stay aware of what [coworkers] are working on	Neutral	Disagree	z = -7.03
3. It is easy to stay aware of what is going on in their lives	Neutral	Disagree	z = -8.49

Table 1: Comparing respondents’ awareness for collocated and remote coworkers

(N=549) compared to a median of “1-5” remote coworkers (N=519). About a quarter of all respondents (26%, N=519) had no remote coworkers, while only 7% (N=549) of respondents had no collocated coworkers.

Table 1 shows responses on a 5-point Likert scale to three questions about both collocated and remote coworkers. While respondents had some awareness of collocated coworker’s schedules, they have more difficulty staying aware of what these coworkers are working on and what is going on in their lives. As might be expected, respondents found it significantly harder to stay aware of the status of remote coworkers than collocated coworkers. This can be explained further by questions in the survey concerning methods that coworkers use to stay aware of each other. The three most popular current methods (respondents could select all that applied) for staying aware of collocated coworkers are unavailable to remote coworkers: “*Noticing them (for example, when they walk by my office or desk)*” was chosen by 79% (N=487), “*Face-to-face status meetings*” was chosen by 77%, and “*Hallway chats*” was chosen by 72%. Relatively few people (collocated 19%, remote 20%, N=379) used “*digital sources such as web pages or work-specific applications.*”

SHARING OF AWARENESS INFORMATION

Respondents were asked about their current sharing of 15 different information types, inspired by the categories from Olson et al.’s survey [7], including identifying information (e.g. Email Address, Work Phone Number), information about current activity (e.g. Current Meeting, IM Status) and past and future activities (e.g. Calendar Details for today and tomorrow, Login History on their primary computer, Past Availability based on IM status). Figure 1 lists all the information types asked about, with the top rows for each information type representing current sharing habits. The left bar (green) show the proportion of participants for whom “*All coworkers have access*”, the middle bar (grey) “*Some coworkers have access*”, and right bar (red) “*No coworkers have access*” to the information (not applicable was also an option).

For the first four information types listed in Figure 1 (Work Phone Number, Email Address, Geographic Location, and IM Status) the median response was that all coworkers

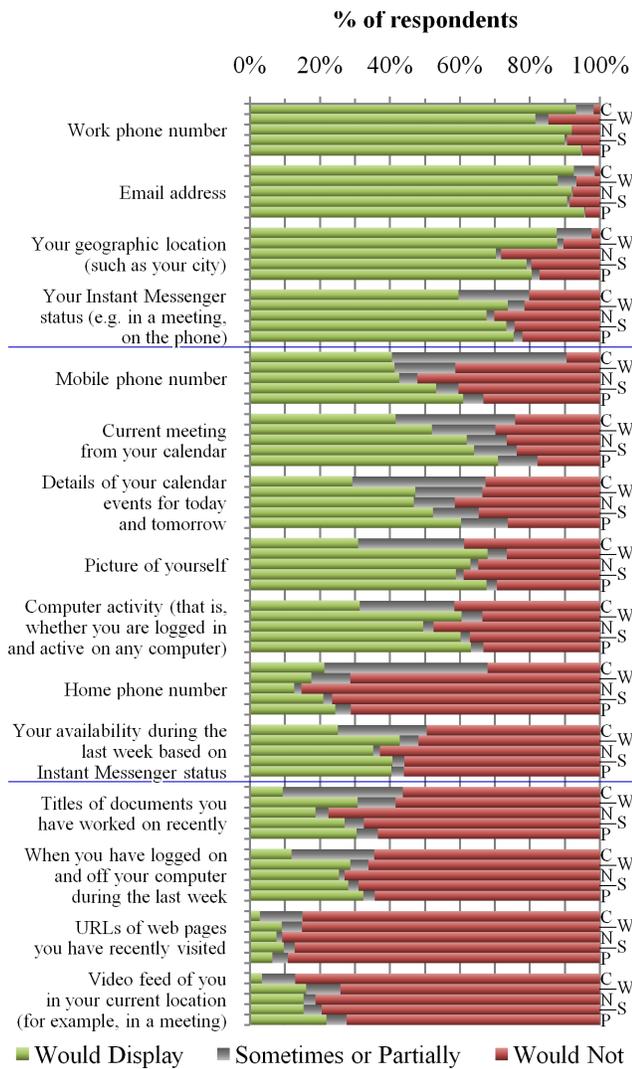


Figure 1: The current sharing pattern (C) and willingness to share for four locations (Website (W), Nameplate (N), Screensaver (S) and Person Screen (P)), for each information type and across all respondents, ordered by descending current sharing.

currently have access. The next seven (Mobile Phone Number, Current Meeting, Calendar Details, Picture, Computer Activity, Home Phone Number, and Past IM Availability), all have median response that “Some coworkers have access” while the final four information types listed in Figure 1 (Document Titles, Login History, URLs, and Video) have a median response of “No coworkers have access.”

Other Display Locations

To explore whether the location in which awareness information is displayed affects what people were willing to share, we asked about respondents’ willingness to display each information type in four diverse display locations:

Website: on a personal website accessible to anyone in their company (*not “situated”*; *accessible anywhere*)

Nameplate: on a screen placed just outside their work area (drawing from e.g. [2]) (*situated in a semi-public space collocated with respondent*)

Screensaver: on a screensaver running on the computer at their desk (*situated in the respondent’s private space*)

Person Screen: on a small screen (similar to a digital picture frame) given to chosen coworkers to put in their office (*situated in remote coworker’s private space*)

Respondents with no collocated coworkers (38) were not asked about the Screensaver or Nameplate. Respondents with no remote coworkers (133) were not asked about the Person Screen.

In Figure 1, for each group of five bars the top bar represents the current sharing pattern while the bottom four bars represent willingness to share using the four display locations. For the bottom four rows, the left portion of each bar represents “Would Display,” the middle portion represents “Would Sometimes or Partially Display” and the right portion represents “Would Not Display.” Contrary to our expectations, there were relatively few differences between what people thought they would be willing to display in different locations. (N.B. respondents could not visually copy their answers across display types since they were presented on different screens).

Respondents were willing to display the first four information types that they currently share with all coworkers in each display location (median response = “Would Display”). On the other hand, respondents were not willing to share, in any display location, the bottom four information types that are not generally currently shared (median response = “Would Not Display”).

There were some differences between what respondents do now and what they claimed they would be willing to do. The median response for the Picture and Current Meeting was “Would Display” for all display locations, suggesting respondents would be willing to share that information more extensively than they currently do. Conversely, the median responses for Home Phone Number and Past IM Availability were “Would Not Display” for each display location, even though currently “Some coworkers have access.” Comments from the survey suggest that respondents would like be selective about sharing this information either filtered by recipient (“Only to selected friends”) or by situation (“Emergencies Only.”)

Only three information types: Mobile Phone Number, Calendar Details, and Computer Activity showed significant variation in the medians between locations. Friedman tests with follow-up pairwise Sign tests for each information type showed that respondents were significantly less willing to share Mobile Phone Number and Computer Activity on the Nameplate display compared to the other three (all $p < 0.001$) and less willing to share Calendar Details on Nameplate compared to the Person Screen and Web (all $p < 0.002$). Interestingly, Mobile Phone Number and Calendar Details were the only data

types with significant differences between external and internal participants. Externals were significantly more willing to share both Calendar Details and Mobile Phone Number on the Screensaver, Nameplate and Person Screen compared to internal respondents (Mann-Whitney U tests, all $p < 0.007$).

OBSERVATIONS

Surprising Comfort with Sharing on Websites

Our expectation was that users would share the least information using the Website, as we had stipulated it would be viewable by the respondent's entire company. We were surprised by the low number of people our respondents expected to see their website (median = "1-5 coworkers per week") and the willingness of respondents to share information items on a Website.

One explanation for this is that users are already familiar with this type of sharing (due to e.g. Facebook), and despite our stipulation, people responded as if they could control the audience, as the technology can allow. This was backed up by some comments ("*For personal websites, I would like to control groups of people and how much info they see about me.*", "*Close Coworkers only. Not all corp.*").

When asked about restricting access to their personal website, the median response was to give "11-20" coworkers access (N=490). If the access was restricted, respondents were evenly split over whether they would share more (46%, N=487) or display the same amount of information (46%) indicating that some people may have been considering a limited group of people in any case.

Situated Does Not Imply Private

On the other hand, we had expected that the Nameplate, Screensaver and Person Screen would benefit from a more private perceived audience and therefore more information would be displayed. Again, respondents did not agree, and highlighted that although the audience may be more predictable, situated displays may be viewed by unintended people ("*I would want to have at least a pin code for my coworker to unlock this personal screen in case a stranger walks into my coworker's office*").

Privacy of Unoccupied Offices

Comments made by respondents suggested that we had underestimated feelings of ownership over the private office space, even when it was not in use by the owner. These included "*I would not give anyone any incentive to enter my office such as these described,*" "*A screensaver encourages random traffic in to my office when I'm not there, which I'm not comfortable with,*" and "*I don't like the screensaver idea because even though my door doesn't lock, it's still considered personal space.*"

Remote Coworkers are Closer than You Think

To better understand how people envisioned using the Person Screen, we asked respondents to tell us the location of coworkers for whom they would like to have a Person Screen (N=353). We were somewhat surprised that the

most popular coworker location was "*A few steps away from your primary work location*" (41%), as this was much closer than we expected. The interest people showed in having a Person Screen for nearby coworkers supports previous research suggesting that the effectiveness of collaboration degrades with physical distance and that even short distances matter [8].

CONCLUDING REMARKS

We conducted a study of 549 knowledge workers and found that people do have difficulties staying aware of coworkers' schedules, what they are working on, and what is happening in their lives, particularly for remote coworkers. We were surprised to find that respondents were disinclined to use different locations as a way of sharing different information levels to different audiences, and that the Website was very popular despite its open audience.

Our survey provides those building situated awareness displays insights on the types of information people wish to share, the locations of coworkers that people wish be more aware of, and reactions to display location.

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