

Diverse Strategies for Interruption Management in Complex Office Activities

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ABSTRACT

Interruptions are common in today's workplace. Some researchers have viewed interruptions as unwanted disruptions, using restrictive techniques to reduce them. Others have seen value in relevant interruptions, promoting their helpful effects, while classifications of interruptions have noted both the positive and negative consequences of interruption types. This poster describes strategies and artifacts for managing interruptions across various applications and media, revealed during ethnographic interviews of office workers in a large software company. Results show complex patterns of problems and advantages of interruptions, and suggest a more complex account of interruptions in working life.

Author Keywords

Activity management, task management, interruption management, work analysis.

ACM Classification Keywords

H5.2. User Interfaces: Methodology; H5.3. Group & organization interfaces: Methodology.

1. INTRODUCTION

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Interruption of on-going work has been a CSCW and HCI issue for at least a decade. Interruptions have been described as extremely disruptive, as "constant, constant, multi-tasking craziness" [5], as events that can cost a knowledge worker as much as 15 minutes in recovery time [8], and as a *problem* in that interrupted work may never be completed [4] – i.e., interruptions are something to be avoided in UI design "wherever possible" [1].

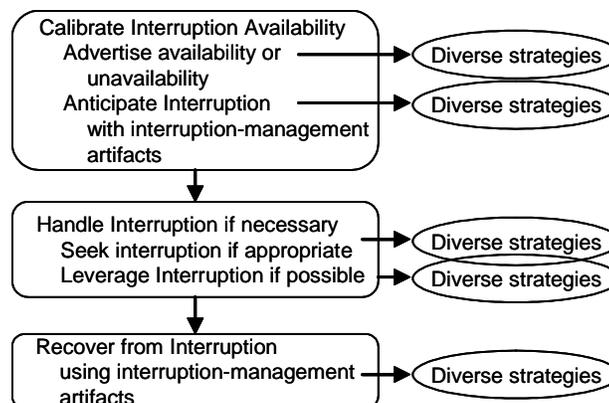


Figure 1. Interruption management and strategies

Other studies have found that interruptions can sometimes have beneficial effects, depending on the type of interruption [9], the type and complexity of the primary task [2, 3, 14] and the relevance of the interruption to the primary task [12, 15]. Furthermore, it is becoming clear that users sometimes seek out interruptions [7]. Nonetheless, users generally report negative reactions to interruptions, including annoyance and anxiety [1, 15], and feeling overwhelmed [6].

Previous research reported primarily the types and effects of interruptions within specific technologies, and appeared to follow a simple of *Avoid interruption if possible → Handle interruption if necessary → Recover previous activity*. However, the so-far unreported strategies that users employ to anticipate and leverage interruptions *across multiple communications technologies* may prove important for understanding how the systems we design will be used in practice. In this poster, we describe these interruption management strategies and the artifacts generated as a result. These results are part of an on-going study of interruptions in the context of day-to-day activities, [10]; a methodological approach to a different stage of this research has been submitted as [11].

2. METHOD

We conducted ethnographic interviews with five members of a large software organization, recruited from the corporate directory. Informants included two technical consultants, a project manager, a program manager, and an offerings manager. Interviews took place at the informants' work sites (except for one telephone interview with a worker in a home office). Interview topics included the informant's job and role, the applications most frequently used, attitudes about interruptions, and strategies or artifacts used for interruption management. Questions were specifically phrased to focus on the experience of interruptions, rather than on features of specific technologies. We also compared informants' actual versus preferred interruption management strategies.

3. RESULTS

Informants' descriptions of their interruption management strategies suggest several revisions to the simple *Avoid → Handle → Recover* model from the research literature. Our revisions are summarized in Figure 1, and involve three phases: Calibrating interruption availability, Handling and leveraging interruptions, and selective recovery. The results reflect strategies across a variety of interruption sources, including email, instant messenger (IM), telephone, in-person visits, and unplanned events.

3.1 Calibrating Interruption Availability

Informants understood the consequences of an interruption in their individual work environments, and almost all had a clear definition of what kinds of situations were too costly to interrupt. Work involving high levels of concentration (i.e. programming, writing papers), items that were nearing deadline, and situations involving higher degrees of etiquette (i.e. conducting an interview) were deemed as the most costly to interrupt.

However, all informants reported making themselves available to *selected* interruptions. One informant stated that "my job is to communicate", but nonetheless needed to protect some communication from interruptions. Other informants described situations in which they vigilantly looked for specific interruptions that had to be addressed. The criteria typically involved the identity or role of the person who was interrupting (i.e. client, informant's children). Some informants used caller-id to screen callers, both on the office phone or on the cell phone.

Informants used diverse strategies to reduce the likelihood of less desirable (or less strategic) interruptions. Several informants advertised their unavailability to deter others from interrupting in-person or on IM, sometimes adding information about when they would again be available. One informant used a pre-written set of sticky notes to advertise her status (i.e. “Back in 15”, “In a meeting”); these notes were kept on the inner surface of her office door, ready to be moved onto the outer surface upon need.

Other, more coarse-grained strategies for avoiding interruptions included disconnecting from the network and/or telephone, going to other locations (i.e. other parts of the building, or even a public library), or simply ignoring the interruptions.

3.2 Handling and Leveraging Interruptions

There were also situations where interruptions were anticipated, with artifacts to reduce the impact of the interruption. Informants used sticky notes, notebooks, and single pieces of paper to mark a few words about the interruption as a way to remind them for later handling. One informant handled nearly all of her online interruptions in this way – that is, rather than *avoid* online interruptions, she *processed* each interruption into a state of initial diagnosis and recording. She deliberately placed each of her interruption-records directly on her physical desk, so that she would have to notice them at the conclusion of her current activity.

In some cases, interruptions were welcomed or self-generated. Welcomed interruptions mostly involved socializing (i.e. hearing from a friend, children IMing, social visits) or were interruptions related to current work. Some noted feeling the need for a break or being blocked in current work as causes to browse the web, check email, or take a brief walk.

Most informants noted situations where a handled interruption led to beneficial options. Some informants took the opportunity to take breaks or check mail. One informant described an IM serving as a reminder to complete another task. Others mentioned reprioritizing their task list in light of the interruption. In some cases, this reprioritization led to the strategic abandonment of the activity that had been interrupted.

3.3 Recovering from Interruptions

Methods for restoring context after an interruption involved, in all cases, a full re-acquaintance with the environment the person had left. When returning to either a computer or desk, informants generally re-read all items in view. However, participants did not perceive this recovery time as burdensome. We attribute this to the high skill-base of the selected participants [13]. Future work will focus on novice as well as expert users.

4. CONCLUSION

As noted above, the previous research has tended to follow a simple, technology-specific model of *Avoid Interruption if possible* → *Handle Interruption if necessary* → *Recover previous activity*. Our study suggests a more complex account, informed by users’ strategies and artifacts spanning multiple technologies. Our informants describe a process in which they calibrate their availability, and take steps to inform partners of that calibration. Interruptions are handled in a number of ways, including refusal, deferral, and rapid partial processing. Interruptions may lead to advantageous outcomes, including communication or collaboration with key partners, options to engage in other timely activities, and the option to reprioritize activities, up to and including the deliberate abandonment of

the interrupted activity. Recovery from interruptions is based in part on artifacts that were placed in strategic readiness for anticipated interruptions,

We look forward to testing this preliminary description with a larger and more diverse sample of informants, and to providing a fuller account in a future report.

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