

TIMESPACE IN THE WORKPLACE: DEALING WITH INTERRUPTIONS

Brid O'Conaill and David Frohlich
Hewlett Packard Labs.,
Bristol, UK, BS12 6QZ
boc@hplb.hpl.hp.com and dmf@hplb.hpl.hp.com
+44 272 228979

ABSTRACT

We report findings from an observational study on the nature of interruptions in the workplace. The results show that in most cases, (64%), the recipient received some benefit from the interruption. However in just over 40% of interruptions the recipient did not resume the work they were doing prior to the interruption. Some implications for time management and communication technology are presented.

KEYWORDS: Interruptions, workplace communication, CSCW, ethnography

INTRODUCTION

A great deal is known about how people use *workspace* in the workplace, and there are well established techniques in both HCI and CSCW for supporting these activities. For example, the 'desktop metaphor' is an attempt to recreate the kind of messy desks that are so useful for personal information management, [5], while 'shared workspaces' constitute an extension of the metaphor to support interactive document use and interpersonal information management [2].

In contrast very little is known about what might be called *timespace* in the workplace; defined as the intervals of time into which people organise their work. Despite the proliferation of both paper and electronic time management systems there are very few scientific studies of time management *behaviour* at work. One reason for this is the very short time window of most workplace and human factors studies. A second reason is that many studies rely on reports of time allocation which are demonstrably inaccurate compared to actual measures [6].

In this paper we report some preliminary findings on the use of *shared timespace* in the workplace, based on an analysis of interruptions. Interruptions are interesting because they reveal that the timespace of any individual is not owned and controlled in the same way as their workspace, but can collide and merge with that of another individual unexpectedly. Herein lies a problem for most time management systems which tend to assume a greater degree of control over timespace than is actually possible and overlook the potential benefit of interruptions to individual work. Interruptions also constitute a problem for

many remote collaboration tools such as pagers, mobile phones and real-time conferencing products. By improving synchronous access between remote parties they tend to benefit the *initiators* with the *recipients* having little control over the receipt of the interactions. Over time they may, therefore, become self-defeating as users realise the costs of making their own timespace more available to others.

Interruptions raise questions of both practical and theoretical significance which we set out to address in the study, including: How many interruptions occur at work? What proportion of time do they consume? How many are resisted rather than taken? Who benefits from the ensuing interactions? How disruptive are interruptions to the prior task being carried out prior to the interruption?

METHOD

To answer these questions we conducted a new analysis of data from an observational study of workplace communication in which two subjects were shadowed with a video camera for a full working week. The participants were mobile professionals for whom communication formed a central part of their job. Each exhibited a form of local area roaming; in building for one and out of building/metropolitan for the other. Further details of the shadowing method can be found in Whittaker, Frohlich & Daly-Jones [7]

RESULTS

Beginning with 29 hours of video data we extracted 125 naturally occurring interruptions. We defined an interruption to be a synchronous interaction which was not initiated by the subject, was unscheduled and resulted in the recipient discontinuing their current activity. Thus, silent document delivery while the subject was working on their PC was not counted as an interruption, but a request for a signature while the subject was in the course of a telephone conversation was included. On average the subjects were being interrupted just over 4 times every hour. The average duration of an interruption was 2 minutes 11 seconds. Approximately 10 minutes in every hour was being spent engaged in an interruption.

The majority, 79, of these interruptions occurred in a face to face setting in the subject's workplace. A further 21 occurred face to face but while the subject was away from their office. The remaining 25 were telephone calls.

Interruptions are usually thought of as being a nuisance for the recipient. For each interruption we analysed the content, to determine, for whose benefit the conversation had been (see Figure 1). Non work related interactions were taken as

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being jointly beneficial. The largest number of interruptions were for the benefit of both initiator and receiver, 43.2%. The initiator benefited solely from 32.8% and the recipient from 20.8%. Thus, in 64% of the interruptions the recipient received some benefit from the interaction having taken place. In 2.4% of the cases the interruption was initiated for the benefit of a third party.

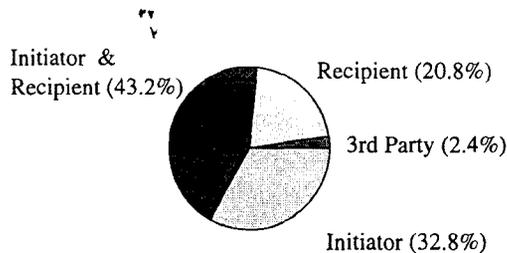


Figure 1: Beneficiary of interruption

We also measured what activities took place after the interruption. Did the recipient return to the prior activity or was there a disruption in the flow of work? In just over 55% of the cases the recipient returned to their original activity (see Figure 2). Although from the data it was not possible to say if their performance in carrying out that task had been affected.

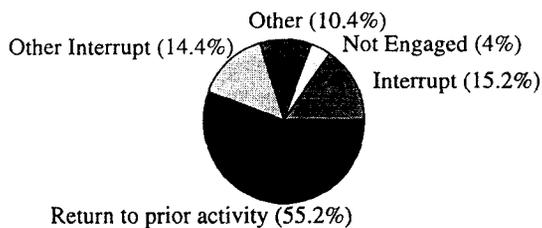


Figure 2: Next Activity

In 4% of cases the recipient was not engaged in a measurable work activity, (having coffee etc.) In the remaining cases the recipient failed to return to their prior activity because they were interrupted again, 14.4%, they proceeded to work on the interrupt, 15.2% or they decided to work on another task, 10.4%. Note there had been no prior indication that the task had been finished.

Only two attempts to dissuade interruptions were observed. In one case, the initiator was given a time limit in a joking fashion. In another, a request was made to the subject's secretary to hold calls. This was done when a tight deadline was approaching for a piece of work to be completed.

DISCUSSION

Our analysis suggests that interruptions are a frequent and time consuming feature of office life which are seldom resisted by recipients. Furthermore many interruptions (41%) result in the discontinuing of the interrupted task beyond the duration of the interruption itself. However, the analysis also shows that recipients often derive personal benefit from the interruption, sometimes at the expense of the initiator!

The complexity of these findings on shared timespace is not well accommodated by existing technology. Some time management systems recommend that users make themselves unavailable to interruptions for specific periods of the day or week so as to concentrate on their own objectives. This blanket approach ignores the benefit that recipients receive from being interrupted, and the service that individuals may be contracted to perform for others. On the other hand, using the latest communication technology to make oneself always open to interruption reduces the length of time people have to continuously perform the same activity.

Clearly some kind of filtering of interruptions would be desirable, to determine if the current interruption warranted disruption of the prior activity. Indeed, this function is often performed in conjunction with receptionists or secretaries to good effect. Given the brief nature of many interruptions such a filtering mechanism needs to be very light weight since the filtering process itself could be as disruptive as an interruption. Video diary technology might be useful in two ways here [1]. First, if an interruption is allowed to proceed, recipients might benefit from reviewing a brief audiovisual record of the end of the interrupted activity to reset its context, particularly if that was itself an interaction. Second, if an interruption was resisted, a record of the context for the interruption could be saved for later reference and action.

Another approach would be to move interruptions to asynchronous communication media. Previous work suggests that it is not the duration of the interruption that makes it disruptive but rather the complexity of the new task [4]. Thus, asynchronous media should be designed to allow the storing and transfer of complex messages and data. To this end combined audio and written messages appear to provide benefit in terms of fewer turns and hence fewer interruptions [3].

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