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Recommended Citation

Gupta, Ashish and Li, Han, "Exploring the Impact of Instant Messaging (IM) on User Performance and Perceived Workload" (2008). *MWAIS 2008 Proceedings*. 16.

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Exploring the Impact of Instant Messaging (IM) on User Performance and Perceived Workload

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ABSTRACT

Instant messenger is being rapidly deployed in the workplace. Current studies largely focus on the adoption of IM and how IM is used. Little research has been conducted to understand the potential impact of using IM in the workplace. This paper contributes to the literature on Instant Messaging by theorizing how some technological features of IM could intertwine with social characteristics and jointly influence user task performance and perceived workload. We hypothesize that the effect of interruption on task completion time is likely to be dependent upon the hierarchy level of message sender and that interruptions from a supervisor aggravate the negative impact of interruptions on task quality.

KEYWORDS

Interruption, Instant Messaging, Task Performance, Perceived Workload

INTRODUCTION

Instant Messaging (IM) is a computer mediated communication medium that has been widely adopted for social communication in daily life but its popularity for more informal as well as complex workplace interactions is also increasing at a phenomenal pace. IM is typically used as complement for existing communication media such as email, phone, etc. In the work setting, instant messenger is often required to be left on while workers are performing some main tasks. It has built-in awareness features and recipients are usually expected to respond immediately. This may increase the disruptive nature of IM. Until now, few studies have empirically studied the impact of considering the typical usage context of IM.

This study takes into account some of the social characteristics of IM and focuses on the impact of multitasking and interruptive nature of IM on the objective task performance and work overload. In particular, our research questions are: 1) What is the impact of interruptions from IM on users' task performance? 2) What is the impact of interruptions from IM on users' mental workload?

This study has important implications for the companies using IM as alternative communication channel. It suggests that such companies deploying IM will need to pay greater attention to the interruptive nature of IM, which could reduce task quality and potentially increase employees' work overload. Additionally, companies should consider the hierarchy level of the sender while formulating policies pertaining to IM use. For instance, policies pertaining to when an employee should respond to a message sent by a peer may differ from the ones dealing with messages sent by supervisor, potentially alleviating the adverse

impact of interruption on performance. This study also provides important direction to future research of IM by emphasizing the fit between technology and hierarchy level of sender.

LITERATURE AND RESEARCH HYPOTHESES

Task Performance and Work Overload

The study used two objective measures of task performance: task time and task quality. IM is typically used in a multitasking environment. Knowledge workers process some main tasks while responding to IM messages. We are interested in how interruption(s) from IM could influence the performance on the main task. Therefore, task time refers to the time to perform the main task excluding the spent on IM tasks and task quality was measured by the degree of correctness of the main task. Work overload is another dependent variable used in this study. Work overload has been found to be the strongest predictor of the exhaustion of IT workers and further lead to high job turnover intention (Moore 2000). In this study, we examined it as a dependent variable.

Interruptions and Hierarchy Level of Message Sender

According to distraction conflict theory (DCT) (Baron 1986), interruptions could narrow one's attention. Such narrowing in attention or processing capacity will cause a decision maker either to adopt a heuristic information processing strategy or spend longer time on the primary task. With the increase in the frequency of interruptions, the heuristic information processing strategy will cause decision makers to reduce the time spent on primary task. The hierarchy level of the message sender may interact with interruption frequency and determine when heuristic processing takes place. When the interruption message is from a supervisor, message receiver may give a higher processing priority to interruption messages and likely use heuristic strategy to perform the primary task. Therefore, we hypothesize:

H1: The hierarchy level of message sender moderates the relationship between interruption and task time.

H1a: The higher the interruption frequency, the shorter the time spent on a primary task when the interruption message is sent from a supervisor.

H1b: The higher the interruption frequency, the longer the time spent on a primary task when the interruption message is sent from a peer.

Speier et al (Speier et al. 1999; Speier et al. 2003) found that interruptions could reduce task quality for complex tasks. Complex tasks require more cues to be processed than simple tasks. In this study, we examined the effect of interruption frequency while controlling for the perceived task complexity level. The increase in interruption frequency is expected to augment the degree of narrowing in processing attention and, at high interruption level, the task quality of all types of tasks may be compromised. Therefore, we have

H2: Interruption frequency has a negative impact on task quality.

Interruption messages sent from a supervisor may be more disruptive than those from a peer. Knowledge workers are likely to allocate extra attention to respond to interruption messages generated by their supervisor and opt for a heuristic strategy to process the primary task. As a result, fewer information cues relevant to the primary task will be processed. The quality of a primary task is expected to be compromised more severely by the interruption from a supervisor than that from a peer.

H3: Position power of the message sender has a negative impact on task quality.

Perceived workload is the perception that one has too much to work on (Leiter et al. 1996). Under high interruption frequency, message receivers are likely to feel time-pressured and experience mental overload. Further, interruptions may share the same sensory channels as the primary task, causing potential loss of working memory or confusion of cues of different tasks (Speier et al. 2003). Therefore,

H4: Interruption frequency increases perceived workload.

COVARIATES

The research model consists of four control variables: gender, IM experience, previous experience of supply chain related tasks, and task motivation. The impact of communication medium on task performance may be dependent on experience with the medium and the task (Suh 1999). For instance, IM experience and previous task experience are expected to improve task performance. Also, individuals' motivation to perform the task is likely to influence their task performance (Maynard et al. 1997). These four variables were controlled for all dependent variables. Figure 1 describes the research model and various proposed hypotheses in the study.

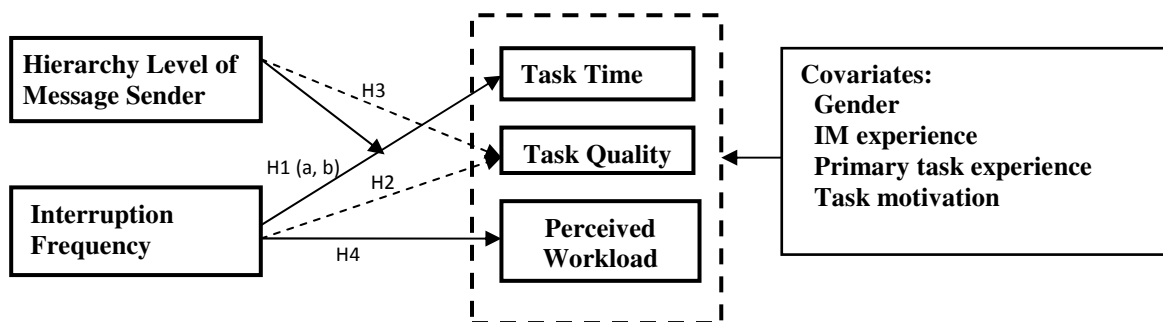


Figure 1. Research Model

RESEARCH METHODOLOGY

Experimental design was used to manipulate the frequency of the interruption and hierarchy level of the message sender. The frequency of the interruption was manipulated at two levels: low interruption and high interruption. Subjects received one IM message at low interruption level and four IM messages at high interruption level. The hierarchy level of message sender was manipulated at two levels: peer and supervisor. So, the two manipulated variables jointly form four treatment conditions.

Subjects were randomly assigned to only one of four treatment conditions. A printed task page was used to introduce the task scenario to subjects and provide detailed step by step instructions. The main task was to browse the websites of UPS and U.S. Postal Service and search for costs of shipping two types of packages to a warehouse. While subjects were performing the search tasks, they were interrupted by instant message(s) sent from their project member or project manager. The instant messages requested subjects to compare eight suppliers based on account payable term, delivery time, or product costs. Subjects were instructed to respond instant messages once they received them. Each interruptive IM task typically takes about 30 seconds to be completed. The design of IM task is consistent with the typical

usage profile of IM, i.e. used for short, simple, and quick communications (Cameron et al. 2005; Hung et al. 2006).

* Both authors have made equal contributions and are arranged alphabetically.

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