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Unintended Consequences of Instant Messaging in the Workplace: An Empirical Study

Jesus Carmona, Dept. of MIS & Decision Science, Texas A&M International University, 5201 University Boulevard, Laredo, TX, 78041, Tel: +1-956-326-2512, Fax: +1-956-326-2554, Email: jcarmona@tamiu.edu

ABSTRACT

Collaboration in the workplace has changed a great deal with the advent of technology; e-mail, instant messaging (IM), chat rooms, and teleconferencing are just some examples of such technological advances. The ways in which we use these technologies depend on what the user whishes to accomplish; IM, for example, can be used to convey informal synchronous messages to coworkers, which in turn, can bring unintended consequences like interruptions and presence awareness. The purpose of this research paper is to study the impact that IM in the workplace will have on interruptions and presence awareness; secondary data obtained from PEW Internet and American Life surveys was used to conduct a statistical analysis using structural equation modeling. The results of this study confirmed that IM had a significant effect on interruptions and presence awareness whereas presence awareness had no effect on interruptions.

Technology has changed the way in which we communicate in the workplace; new and improved computer-mediated communication tools are available for our use, and media choice has become an issue (Cameron, 2005), nowadays it is hard to decide what communication tool to use, or how we convey messages when using certain media (Trevino, et al, 1990).

Instant Messaging (IM) is a computer-mediated tool that is used to send and receive text messages in a synchronous manner, using the Internet. IM has become a common channel of communication between family members and friends (Goldsborough, 2001); almost 53 million adult Americans trade instant messages and 24% of them swap IM more frequently than email (Shiu and Lenhart, 2004). After seeing the usefulness of this tool, managers are beginning to introduce it in the workplace as an informal way of communication; at the same time, IM seems to bring unintended (not necessarily bad) consequences like presence awareness (Cameron, 2005), and interruptions (Rennecker and Godwin, 2005).

RESEARCH BACKGROUND AND HYPOTHESES

Presence awareness is the ability to see who is on-line at certain specific times. Most IM systems have a list that displays the users that are connected to the Internet. This list helps conversation initiators to judge if recipients are likely to be available to engage in a conversation (Nardi, et al., 2000); most IM systems have the ability to post an "away" or "busy" message to let others know the status of the IM user, reducing at the same time the interruption level by allowing recipients to negotiate availability. To compensate for privacy concerns, IM Systems are also capable of blocking users from the list in order to "hide" from them; this gives the user the complete control over who is seeing him as "on-line" (Cameron, 2005). IM users sometimes send short messages (e.g. "hello?") to engage or initiate a conversation, and it is up to the recipient to either answer or wait for a more appropriate time. Privacy concerns are important for people, and even though presence awareness can be considered as invasive, most users found the monitoring system on IM not being as invasive as video cameras (Zweig and Webster, 2002).

H1: The use of IM in the workplace will have a positive effect on presence awareness.

O'Conaill and Frohlich (1995) define interruption as "a synchronous interaction which is not initiated by the recipient, is unscheduled, and results in the recipient discontinuing their current activity". As one can see from the definition, interruption does not necessarily means disruption, but even the notification of an incoming message can cause interruption, which may or may not negatively affect performance (Cutrell et al., 2001). It has been hypothesized that interruptions derail the flow of activities directed toward the accomplishment of a task and delays can contribute to work disorganization when a worker is unable to move forward with a task due to insufficient information (Rennecker and Godwin, 2005). From the previous argument, one can expect that IM users, especially recipients, may see IM as interruptive. This leads to a second hypothesis:

H2: The use of IM in the workplace will have a positive effect on interruptions.

The use of IM has been introduced by managers in the workplace as an informal way of communication; even though it is considered informal, the sense of urgency has made IM the medium of choice when information is needed to complete a task (Nardi, et al, 2000). One way in which a task at hand can be delayed is by not having the information needed; a common way to obtain this information (from a co-worker or supervisor) is to contact the person either using an asynchronous medium (e.g. e-mail) or a synchronous medium (face-to-face, telephone, IM). In the former method, more delay can be experienced because of the nature of the medium. If the latter method is used, we can ensure a faster response, and each type face-to-face, telephone, and IM would have its own advantages and disadvantages (Rennecker and Godwin, 2005). IM is a good choice because thanks to the presence awareness, a negotiation is possible between the initiator and the respondent. First, by taking a quick look at the "on-line" list a person can tell if a user is available or not; second, from the status on the list, one can determine if the user is "busy" or "away"; and third, a quick "are

Figure 1. Hypothetical model and hypotheses

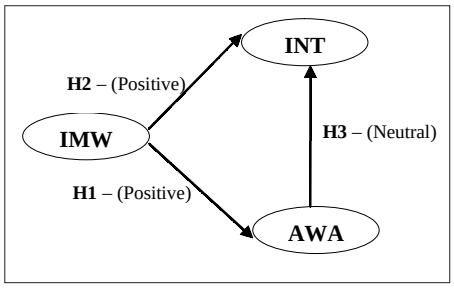


Table 1. Item loadings per construct

Construct	Item	Item loading
Interruption	INT1	0.7617
	INT2	0.8930
	INT3	0.8041
Presence Awareness	AWA1	0.7974
	AWA2	0.7989

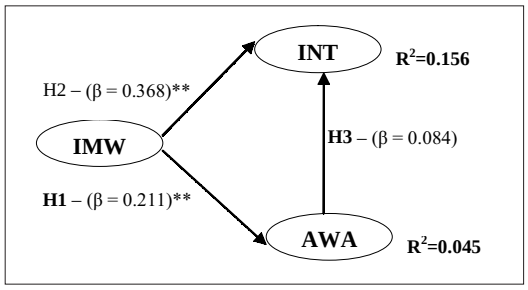
Table 2. Reliability, convergent and discriminant validity coefficients.

	CR	AVE	INT	AWA
INT	0.861	0.675	**0.822**	
AWA	0.778	0.637	0.167	**0.798**

CR- Composite Reliability; AVE – Average Variance Extracted

Diagonal elements are the square root of AVE. Off diagonal element is the correlation between constructs.

Figure 2. Results of the PLS analysis



you there" message can ensure that the user is available and ready to communicate (Nardi et all., 2000). This discussion leads to a third hypothesis:

H3: Presence awareness will have no effect on interruptions

RESEARCH METHOD

The method employed for data analysis in this study was Partial Least Squares (PLS), an alternative structural equation modeling technique (Chin, 1998). PLS was implemented through the PLS-Graph software V.03.00 (Chin, 1998). A subset of 111 elements of the February 2004 PEW Internet and American Life surveys (http://www.pewinternet.org) dataset was used as a sample for the statistical analysis; this subset contained only respondents that acknowledge using IM in the workplace.

In Table 1, we can observe the loadings of each item for each construct. All items have a value greater than 0.7, making them suitable (Fornell and Larcker, 1981) to be used on each construct. Table 2 shows composite reliability, AVE, and correlations among constructs. Satisfying (according to Fornell and Larcker, 1981) levels of convergent and discriminant validity can be observed for the presented reflective measurement model.

CR- Composite Reliability; AVE – Average Variance ExtractedDiagonal elements are the square root of AVE. Off diagonal element is the correlation between constructs.

RESULTS

Figure 2 illustrates the structural model with the results of the PLS analysis, showing partial correlations (˜) and R^2. Betas (˜) followed by two asterisks were significant at $P < 0.01$ in a one-tailed T-test; Betas (˜) not followed by an asterisk were non-significant (Rosenthal and Rosnow, 1991). T values were calculated using the bootstrapping method.

From Figure 2, we can observe that the use of IM in the workplace (IMW) had a positive significant effect on interruptions (INT), which provides support for hypothesis H2. In the same figure, we notice how the use of IM in the workplace (IMW) had positive significant effect on presence awareness (AWA), which also offers support for hypothesis H1. Additionally, Figure 2 suggests that presence awareness (AWA) had no significant effect on interruptions (INT), which in turn supports the last hypothesis H3.

Finally, Figure 2 also implies that the relationship described in the structural model accounts for approximately 16 percent of the variance in the interruptions (INT) construct and 5 percent of the variance in the presence awareness (AWA) construct.

DISCUSSION AND CONCLUSION

The findings in this paper are consistent with the reviewed literature. Of special interest is the way in which interruptions are directly and significantly affected by IM and how this same variable is not affected by presence awareness; in other words presence awareness is acting like a filter for interruptions. Presumably the many features that IM has to show the users what is the status of the communicator (if he is "away" or "busy") helps in the negotiation of the interaction between parties. Another interesting result is how people who use IM find presence awareness useful and not intrusive, but instead uses it to their advantage. In fact, awareness can be seen from two different perspectives: the initiator and the recipient. When seen from the initiator's point of view, the results of this study become more obvious because the initiator is the person looking for information, and the presence awareness can give that person a panoramic view of everybody who is on-line and available to answer questions or engage in a conversation. Seen from the recipient's perspective, maybe the inquiry could be interruptive at first, but the IM user has the ability to negotiate and not answer to the first request, and additionally use the "busy" or "away" feature of the IM software. This in turn helps users deal with privacy concerns; most IM software has the "block" function to completely hide the user from unwanted or unsolicited interaction.

One of the biggest limitations of this study was the dataset used for the PLS analysis. Since secondary data was used, the analysis was confined to the number and type of variables available in the set. A replication of this study with primary data could make a greater contribution to the very thin set of scholarly empirical papers in this field. Additionally, the inclusion of some other variables of interest like achieved efficiency, effectiveness, multitasking, delays, etc. will allow a more robust and complete study.

Finally, while only part of the variables was measured here in connection with IM and its uses in the workplace; interesting findings were revealed. A more comprehensive study should be done to attempt to construct a theoretical framework that can be used to explicitly and empirically measure IM, its components and effects.

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