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Instant messaging - blessing or curse for enterprises?

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INSTANT MESSAGING - BLESSING OR CURSE FOR ENTERPRISES?

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Abstract

The rise of new communication technologies such as instant messaging systems in enterprises enables employees to communicate and cooperate in new ways. In general, it is believed that these new communication technologies have a positive impact on communication effectiveness and the attitude towards information sharing of employees but at the same time some negative impacts as well, such as creating communication and information overload for the individual. However, how these technologies really change the communication behaviour is still not well understood, wherefore we conducted an empirical, questionnaire-based survey among the employees of a large multi-national financial institution. Based on the responses of 227 employees, we found that the attitude towards information sharing influences the perceived usefulness of instant messaging systems. Moreover, we found that the information overload has a negative moderating effect on the relation between the attitude towards information sharing among employees and perceived usefulness of the system.

Keywords: Social Media, Instant Messaging, Information Overload, Information Sharing.
1 INTRODUCTION

Emerging communication and cooperation technologies which are usually combined under the term "Web 2.0" are regarded as enablers for enterprises to adjust and improve their internal communication infrastructure (McAfee 2006) while reducing the social distance of geographically dispersed working employees. This is realized by creating a cooperative virtual environment that ultimately leads to improved project performance and business process outcomes (Eveland & Bikson 1987) which is regarded as a unique "digital enablement" of employees (Robert et al. 2008), commonly referred to "Enterprise 2.0" in an organizational context (McAfee 2006).

While there is still a need for face-to-face communication, Web 2.0 technologies increasingly substitute this form of information exchange, e.g., through the use of instant messaging, social networks, and micro blogging (McAfee 2006). From an organizational management perspective this is an important shift since corporate communication technologies are important instruments enabling employees to cooperate and to share information across these boundaries using both, synchronous communication technologies, so called channels (e.g., instant messaging), as well as asynchronous ones, so called platforms (e.g., Wikis, Blogs) (Cummings et al. 2009, McAfee 2006). In general, channels are used more often in enterprises through its ability to ask specific questions and to share individual knowledge directly (McAfee 2006, Ou & Davison 2011). Digital information and knowledge can be created and distributed by all employees. Platforms such as knowledge management systems are highly structured when some content is generated and then individuals have little opportunity to influence this structure. In contrast, instant messaging allows a more flexible and individual information sharing (Ou & Davison 2011). The drawback of instant messaging is that the knowledge is only provided to a limited group and not the whole community (McAfee 2006).

In this study, we focus on exploring the use of a corporate instant messaging system (in the following called "corporate system") of a multi-national financial institute. Instant messaging refers to Web 2.0 (McAfee 2006, Ou & Davison 2011) and allows employees to share their information individually and free of any given structure. The institute under examination uses a customized instant messaging system to enable employees to share information and knowledge. While the acceptance and usefulness of this corporate system plays an important role, we were more interested in how the offered corporate system meets the needs for exchange information among employees, how the attitude towards information sharing is, and how information overload affects the communication among employees.

For this purpose, we conducted an empirical survey-based study in Germany and received 227 responses from participating employees of the financial institute (see Table 1 in the Appendix) to explore their communication behaviours and interaction with the corporate system.

Based on the rational actor perspective (Kling 1980, Markus & Robey 1988), we developed a structural model to measure the perceived usefulness (Davis et al. 1989) of the corporate system. We argue that perceived usefulness depends directly on the attitude towards information sharing (e.g., Bock et al. 2005) among employees. In particular, the attitude towards information sharing is influenced by motivational forces (e.g., Wasko & Faraj 2005), the accessibility of the corporate system (Bruque et al. 2008, Chang & King 2005), as well as social relationships of the employees (Markus 1994), being defined as the personal connections between employees, their subordinates, and superiors (Markus 1994, Sproull & Kiesler 1991). However, other influencing factors such as information overload can influence the use of corporate system. It can be assumed that employees are increasingly overloaded with information leading to situations where they cannot handle their tasks efficiently anymore (Reeves et al. 2008), not at least due to the increasing number of available communication systems (Cummings, et al. 2009). Hence, we explore in our model the influence of information overload on the attitude towards information sharing and use of the corporate system. Consequently, the central research questions we are aiming at in this paper are:
How is the perceived usefulness of instant messaging systems influenced by the attitude towards information sharing?

How does information overload impact on the perceived usefulness?

The remainder of this paper is organized as follows: the next section provides an overview on the theoretical background of this study. Subsequently, we describe the structural model and our hypotheses, followed by the analysis of the data and the results of the measurement model. Finally, we conclude with a discussion and short conclusion.

2 THEORETICAL BACKGROUND

2.1 Rational Actor Perspective

The rational actor perspective (Kling 1980, Markus & Robey 1988) describes how people use a technology and what they try to accomplish with it. In general, an actor tries to manipulate the outcome of some activity in a positive or negative way by deploying technology. For instance, the inappropriate use of e-mails for ambiguous communication can lead to negative results and inefficiency (Daft & Lengel 1984). In addition, this negative or positive behaviour can also cause negative or positive social outcomes (Markus 1994).

In this paper, such negative behaviour is represented by the information overload construct. Information overload is in itself not caused through negative behaviours but rather through the perceived pressure that an individual feels by receiving too much information at one point in time (Eppler & Mengis 2004). However, excessive communication of unimportant information from other employees can be defined as bad behaviours and in the end cause information overload for others. In contrast, intrinsic motivation to help other people with their use of communication technologies or just to share information they need is regarded as a positive behaviour and social outcome (Markus 1994). Attitude towards information sharing can also be seen as a positive behaviour that results in positive social outcomes because individuals show their organizational affiliation to the enterprise and improve relationships among employees (Bock, et al. 2005). In this context, the construct of social relationships (reversely adapted from Markus (1994)) between employees in different hierarchical positions represents also an instantiation of the rational actor perspective: a better social relationship or a familiar environment can cause positive social outcomes by building up relationships among each other and sharing information more often. In contrast, targeting a person with a lower social relationship can cause negative social outcomes and technology use (Markus 1994). However, these negative social outcomes can also turn into benefits, such as fewer responsibilities for tasks. In this context, Sproull and Kiesler (1986) have suggested that subordinates may prefer to use electronic communication when dealing with their superiors because this medium demonstrates their lower hierarchical status. However, in cases of conflicts, face-to-face communication can enhance social relationships (Daft & Lengel 1984, Daft et al. 1987).

In summary, the rational actor perspective explains why actors choose different communication technologies, for instance, to avoid face-to-face interaction, to defuse or impersonalize problematic relationships, or just to manage the communication with others (Markus 1994). Hence, we use this theoretical lens for our model to describe the perceived usefulness of instant messaging caused through different positive and negative behaviours.

2.2 Perceived Usefulness

Modern communication strategies raise the demand for even faster, more flexible, and more user-friendly communication systems (Jahangir & Begum 2007). However, performance improvement depends largely on the level of employee’s willingness to accept and use these systems which is hard to predict. Davis (1989) introduced perceived usefulness as well as perceived ease of use and argues that user acceptance can be examined by taking these two variables into consideration. Since in a
corporate environment employees use the corporate system in place, we focus on perceived usefulness only to understand if the available communication technology is supporting them in their daily work.

Generally speaking, usefulness refers to the subjective perception of actors believing that a certain technology can help the user to accomplish a task (Jahangir & Begum 2007). In this regard, usefulness is a depending variable and defined by the fit of a technology to solve a task. In contrast, perceived usefulness, as it is conceptualized in the technology acceptance model (TAM), is defined as the “degree to which individuals believe that using a particular system would enhance their job performance” (Davis 1989). In particular, perceived usefulness can be understood as the user’s perceptions concerning the outcome of experience and as the extent to what individuals recognize a particular system to improve the quality of their work (Jahangir & Begum 2007). In this paper, we focus on the measurement of perceived usefulness as the experienced usefulness of a technology from a post-adoption perspective in contrast to the pre-adoption view in TAM studies.

2.3 Information Overload

Information overload can be defined as an individual’s inability to deal with too much incoming information in a given period of time (Eppler & Mengis 2004) which may result in elevated levels of stress or even burnouts. In this regard, instant messaging increase the individual information overload (Eppler & Mengis 2004). For instance, asynchronous systems can lead to a lower information overload than synchronous systems through the possibility of the employees to not answer directly to incoming messages (Barley et al. 2011). However, the whole bundle of Enterprise 2.0 allows employees to choose how and from where they want to communicate with their colleagues using different communication systems. In consequence, the work environment becomes more democratized and decentralized which creates new issues for hierarchically organized enterprises and their communication systems (Reeves, et al. 2008). A negative dimension of electronic communication is the disruption of employees whenever they are contacted. Given that not only telephone calls or e-mails are interrupting employees in their daily work, now also instant messaging or microblogging are hindering people from concentrating on their work. Being “always on”, employees become overloaded with information not being able anymore to process it. The consequence is that employees quickly feel exhausted and stressed since they are not able anymore to meet the demands. Hence, the concentration decreases because of an increasing stress level and the employee cannot identify, select, or process the incoming information anymore (Schneider 1987). Ultimately, incoming information is ignored and the selection and prioritization of the information is done without any system and logic (Bawden 2001). In this regard, synchronous communication leads to more interruptions for employees since they have to react directly to the incoming information. Hence, the problem of information overload is accentuated by the implementation of Enterprise 2.0, such as instant messaging, solutions into corporate systems (Reeves, et al. 2008) which reduces the perceived usefulness of a system.

3 RESEARCH MODEL AND HYPOTHESIS

The developed research model in this study is primarily based on the rational actor perspective (Kling 1980, Markus & Robey 1988). The dependent variable ”perceived usefulness” originates from TAM (Davis, et al. 1989) and measures the perceived usefulness of the corporate system. This perceived usefulness depends on the attitude towards sharing information among employees. Hence, the usage of a communication technology can cause positive or negative consequences for the individual (Markus 1994). If the negative consequence are lesser than the positive ones, individuals will use the technology more often (Kling 1980, Markus & Robey 1988).

The measures were deductively derived from prior empirical literature. However, the new and adapted constructs, such as information overload and social relationship, were tested with the Q-sorting technique (e.g., Thomas & Watson 2002) before the survey. Q-sorting was conduct among 4 participants in 2 rounds. In the first round, the participants received 25 indicators from the constructs that should be sorted into arbitrary categories. Thereafter, the classification were analyzed and served
as the input for the second round. In this second round, the participants had to sort selected indicators (based on the analysis of the first round) to preselected categories, e.g., information overload. We used the insights of this technique to improve the conceptualization of our model. Figure 1 presents our developed model with the derived hypotheses which will be explained in the following subsections.

**Figure 1.** Structural model.

### 3.1 Influence of Accessibility to Share Information

In general, individuals are more likely to select and make use of the technology that is most easily and readily accessible (Ilie et al. 2009). Especially related to instant messaging technologies, it is important in business to be able to access them from everyplace and at every time. Because of today's global distributed teams, employees participate in, e.g., conference calls across different time zones and countries (Robert, et al. 2008). Hence, the employees should have the ability to access these systems also outside from their workplace and time. This refers directly to how to treat and process the information that is gained from this technology (Ilie, et al. 2009).

Ilie et al. (2009) explored that accessibility of the technology is a relevant, but largely neglected, factor relating to the individuals’ use of this technologies. A difficult-to-access or hard to reach information source is increasing the search costs for individuals (O'Reilly 1982). When persons are confronted with the decision whether or not to use different information sources, they frequently choose the one that requires the least amount of effort or cost (Ilie, et al. 2009). Hence, time constraints of work may force individuals to seek the most convenient or accessible source (O'Reilly 1982) which has a direct effect on the capability for information processing and distribution (Ilie, et al. 2009). Thus, we posit the following hypothesis:

**Hypothesis 1:** Accessibility to the system positively affects the attitude towards sharing information.

### 3.2 Influence of Motivation to Share Information

Beside the motivation that cooperating with other employees might result in additional rewards, employees receive other benefits from cooperation (Wasko & Faraj 2005). Especially the self-evaluation based on social competence and acceptance is important for an individual (Wasko & Faraj 2005), and sometimes more important than external rewards. External rewards might result in extensive but not comprehensive cooperation to receive these rewards (Bandura 1986). Kollock (1999) found that the motivation to help others positively affects the attitude towards information sharing of people in electronic networks. In addition, the willingness to experience and test new communication technologies (Agarwal & Karahanna 2000) and to help others with these technologies is of high importance for their motivation to share information. Hence, we focus on these motivational factors
because we are interested in the effects of intrinsically motivated employees. Thereby, the construct of motivation reflects directly to positive social outcomes, according to the rational actor perspective (Kling 1980, Markus & Robey 1988). Thus, we propose the following hypothesis:

**Hypothesis 2:** The motivation of individuals positively affects the attitude towards sharing of information.

### 3.3 Influence of Social Relationships to Share Information

In general, communication technologies provide the possibility to use new features, such as synchronous communication. Hence, they are likely to stimulate various positive social outcomes such as increased personal connections (Markus 1994, Sproull & Kiesler 1991) and thereby reflect to the rational actor perspective (Kling 1980, Markus & Robey 1988). These increased personal contacts are not only established between persons who are geographically dispersed (Markus 1994) but also between employees located at the same place but from different hierarchical positions. In this context, they facilitate an increased sociability by enabling persons to maintain easier social relationships as well as to share work-related information (Markus 1994, Steinfield 1986). This phenomena improves the work-related efficiency and the social relations at work (Markus 1994).

Bock et al. (2005) found that social relations within a company can be regarded as one possible factor of an organizational climate. Climate refers to a contextual situation at a point in time and its link to the thoughts and feelings of the employees. In this context, Bock et al. (2005) investigated research in the relation between the organizational climate and the individual tendencies towards the attitude of information sharing. This is realized by an open climate with free-flowing information and that is tolerant of failure (Bock, et al. 2005). Hence, the interpersonal relationships form the information sharing environment among employees. Thus, we propose the following hypothesis:

**Hypothesis 3:** Social relationships positively affect the attitude towards sharing information.

### 3.4 Influence of Attitude Towards Information Sharing on Perceived Usefulness

The behavioural intention model to the rational actor (Ajzen & Fishbein 1980) demonstrate that the intention to engage in a behaviour is determined by an individual's attitude towards that behaviour. In our model, the attitude towards information sharing is directly derived from Bock et al.'s (2005) attitude toward knowledge sharing which is defined as the degree of one's positive feelings about sharing knowledge. Perceived usefulness originates from TAM (Davis, et al. 1989) and explains the acceptance of a technology through the user. This acceptance is influenced by perceived usefulness which is defined by the individual belief that using the technology will provide a benefit. In this context, Kulkarni et al. (2007) argued that the type and quality of information that is available for individuals as well as the precision and relevance of the shared information affects the perceived usefulness of information sharing and finally the use of a system. In addition, if user are satisfied with the provided information, they will be motivated to use the provided technology more often (Hung et al. 2011, Seddon 1997).

Hence, we see a connection between the attitude towards information sharing and the individual perceived usefulness of communication technologies. Thus, we test the following hypothesis:

**Hypothesis 4:** The attitude towards information sharing positively affects the perceived usefulness of the corporate system.

### 3.5 Influence of Information Overload on the Relation between Attitude Towards Information Sharing and Perceived Usefulness

Several studies explored the individual information overload in terms of different communication technologies (e.g., Markus 1994, Reeves, et al. 2008). Especially, Barley et al. (2011) measured this concept in terms of the e-mail usage of employees. They defined information overload as a kind of
emotionally exhaustion, related to the work-day and measured it as a dependent variable. Thereby, they explored the driving factors of information overload related to the e-mail usage. In contrast, we included the concept of information overload as a moderator in our model and based the conceptualization on the research of Schultze and Vandenbosch (1998) as well as Kock et al. (2009). Hence, we are more interested in the consequences of information overload rather than its causes. Thus, we test the following hypotheses:

**Hypothesis 5:** The individual information overload lessens the relation between the attitude towards information sharing and the perceived usefulness of the corporate system.

### 3.6 Controls

To control for other influential factors related to the usefulness of instant messaging systems, we included data on the actual use of the corporate system as a control variable in the model. Therefore, we used the statistics of instant messaging sessions of the respondents. The control variable "use" is measured by instant messaging sessions of the respondents within six month before the survey. The range of each data point of a respondent is located between 0 and 2657 sessions within six month. This data can be used to crosscheck if there is a significant influence of other variables on the dependent variable (Cohen et al. 2003).

### 4 DATA ANALYSIS AND SAMPLE PROFILE

#### 4.1 Data Collection and Sample Profile

To validate the research model and the associated hypotheses presented above, a questionnaire-based field study was conducted. In April 2010, 2000 randomly selected employees of a financial service institution in Germany were invited by e-mail with support from top management. The employees were asked to respond to the survey by filling out an online questionnaire. In addition, the potential participants were asked to completely fill-out the questionnaire to avoid missing values that can cause bias due to systematic differences between observed and unobserved data. Overall, 227 responses were completed and could be used as valid data points for the measurement calculation which depicts a response rate of 11.35 percent. The majority of the respondents was between 30 and 50 years and had been with the firm for more than 10 years (see Table 1 in the Appendix for demographic data).

#### 4.2 Measurement Model

To support the measurement model from a statistically point of view, content validity, construct reliability, and construct validity have to be tested. To ensure the content validity, existing measures from prior empirical studies and literature were deductively derived and adapted to the context of communication technologies (see Appendix Table 2). For all constructs reflective indicators were used and measured on a fully anchored 7-point Likert scale, ranging from “strongly agree” to “strongly disagree”. Construct reliability depicts the internal consistency of the measurement model (Straub et al. 2004). Therefore, the average variance extracted (AVE), the composite reliability, and the Cronbach’s alpha measures the reliability of the measurement model (see Table 3 in the Appendix for the values of this estimation). The recommended minimum for the AVE is 0.5, according to Fornell and Larcker (1981). This means that at least 50 percent of the measurement variance is covered by the construct itself. The composite reliability indicates how reliable the construct is represented by the indicators (Chin 1998). The recommended composite reliability score should be a minimum of 0.7 (Hair et al. 1998) to provide evidence for sufficient reliability. Cronbach’s alpha (Cronbach 1951) is a more common and alternative measure for estimating internal consistency. The recommended score should be a minimum of 0.7 (Nunnally 1978) to provide an indication of internal consistency among the construct’s indicators. Every construct in our model is above the mentioned thresholds.
Construct validity refers to the outer validation of the measures (Straub, et al. 2004). Construct validity evaluates the perspective of relationships between constructs as well as between constructs and their indicators. The AVE measures also the validity of the measurement model (see Table 3 in the Appendix for the values of this estimation). According to Campbell and Fiske (1959), this issue can be subdivided into convergent validity and discriminant validity. We evaluated the convergent validity of the constructs by measuring the degree to which the variance of an indicator can be explained by the underlying construct and by measuring the degree to which the variance can be assessed by the indicator loadings. The recommended loading should be at least 0.707 (Chin 1998) to indicate that the measurement items were used adequate for measuring each construct. Every loading in our model is above the mentioned thresholds. Discriminant validity proofs whether indicators of latent constructs are related or not related to each other (Andreev et al. 2009). Thereby, the cross-loadings (Chin 1998) between the constructs are analyzed. The indicator loading has to be higher on its assigned construct than on the other constructs (Henseler et al. 2009). The calculated square roots of the AVE score (see Appendix Table 3) should be greater than the correlations between the construct and any other construct.

4.3 Structural Model

In this study, the results for the partial least square (PLS) estimation are calculated with SmartPLS (Version 2.0 M3) with a path weighting scheme for the inside approximation (Tenenhaus et al. 2005). As a structural equation modelling technique, PLS comprises a measurement model with a structural model to estimate them simultaneously. In addition, we used a bootstrapping procedure (Chin 1998) by generating 500 bootstrap samples (Tenenhaus, et al. 2005) as well as conducted the bootstrap procedure to test the significance of the path estimates, factor loadings, and weights. In this context, we checked whether the relationship being moderated is less significant or not by including the moderator (Baron & Kenny 1986). We found that the moderator effect of information load lessens the significant level of the relationship between attitude towards information sharing and perceived usefulness to the half. Hence, the moderator effect of information overload can be supported.

To reduce multicollinearity, we standardized all indicators reflecting the predictor and moderator constructs to a mean of zero and variance of one (Chin et al. 2003). This also allows an easier interpretation of the resulting regression beta for the predictor variable. The path coefficient now represents the effect expected at the mean value of the moderator variable. Using the standardized indicators of the predictor and moderator variables, product indicators were generated to reflect the latent interaction variables. The PLS procedure was then applied to estimate the dependent variable.

![ Estimated structural model.](image)
Figure 2 presents the results of this estimation and outlines that all path coefficients are above the minimum of 0.1 (Sellin & Keeves 1994). The squared multiple correlations ($R^2$) depict the explanatory power of the structural model. It is important that the $R^2$ is above the minimum of 0.33 (Chin 1998). Our model explains a moderate value of variance for the dependent latent variables.

5 DISCUSSION OF THE FINDINGS

Since all hypotheses are supported by the survey data, this paper illustrates how individual and technological factors explain the influence of the attitude towards information sharing to understand the usage of instant messaging systems in enterprises. This issue is moderated by information overload which represents a hindering factor to the perceived usefulness of the corporate system. Hereby, several influential factors can cause positive or negative social outcomes (Kling 1980, Markus & Robey 1988).

Of the individual factors, motivation as well as the social relationships cause positive social outcomes in terms of the rational actor perspective. They show significant effects on the attitude towards information sharing within the corporate system. The financial institute uses this system to enable employees to share information and knowledge. This result indicates that a collectivistic culture exists and that employees are willing to share their knowledge.

Moreover, the hypothesis that accessibility to the corporate system positively affects the attitude towards information sharing is supported by the survey data. This outcome is consistent with the literature and that individuals are more likely to select and make use of the technology that is most easily and readily accessible (Ilie, et al. 2009). A difficult to access system would be an instant messaging system that can only be used from inside the company which employees cannot use for conversations outside of working hours and from home for their multinational projects.

According to the perceived usefulness of instant messaging systems, we identified the attitude towards information sharing as the highest impact. It is more or less obvious that communication technologies are designed for communication and information sharing (Bock, et al. 2005). In addition, the individual information overload moderates negatively the relation between attitude towards information sharing and perceived usefulness of instant messaging systems. The employees are more and more overloaded from incoming and outgoing information (Barley, et al. 2011, Bawden 2001, Reeves, et al. 2008) that this moderation has one of the highest effects in the model and leads to negative results in terms of the rational actor perspective. A solution is not to implement manifold communication technologies and try to improve existing spam filters, the employees should be sensitized in terms of their send out information and should be separate between important and unimportant information (Reeves, et al. 2008).

6 CONCLUSION

Grounded in the extant research stream on the rational actor perspective (Kling 1980, Markus & Robey 1988) and adoption of a technology (Davis, et al. 1989), we developed and tested a model for the use of instant messaging systems of a financial institute. Instant messaging allows a flexible and individual information sharing (Ou & Davison 2011) and supports the basic Web 2.0 principles (McAfee 2006). This model extends the understanding of perceived usefulness of a corporate instant messaging system with specific individual and technological factors that capture the information sharing of the employees. In addition, we included information overload in the model to refine the theoretical assumption of our model with regard to the rational actor perspective.

Prior research mainly focused on the adoption of communication technologies (e.g., Brown et al. 2010) or the consequences of technology use (e.g., Daft & Lengel 1984, Reeves, et al. 2008). This paper paid attention to the individual and technological factors that drive the perceived usefulness of a communication technology. The first theoretical implication of our study is that the attitude towards
information sharing is a necessary precondition of the perceived usefulness of instant messaging. If employees are motivated to share information among others they will use instant messaging and related information sharing technologies more often because this provides them easy and flexible possibilities to share their knowledge (Hung, et al., 2011, Seddon 1997). However, information overload has a significant negative impact on this relation. Future research should explore in more detail the negative consequences of instant messaging and the role of information overload in this context. The second theoretical implication is that our study contributes to this topic by sorting information overload in the rational actor perspective with respect to corporate instant messaging.

In general, our results contribute to a better understanding of the driving and hindering forces of the perceived usefulness of communication technologies (in our case a instant messaging system). The data analysis reveals that modern communication technologies are important instruments enabling employees to cooperate and to share information with each other and across organizational boundaries. Through the possibility to share information with these technologies, they have a high perceived usefulness among employees. Hence, instant messaging can be seen as a blessing for enterprises by providing employees the opportunity to communicate easily and flexible. However, instant messaging is widely accepted but also contributes to more information overload. Hence, the practical implication of our study is that enterprises should sensitize their employees for their outgoing information to lessen the information overload of other employees (Reeves, et al. 2008) and not to implement instant messaging as a communication curse.

This study is limited due to the sample profile of the survey as well as the focus on instant messaging systems. Future research in this area should extend such studies to other sample profiles, e.g., an inter-organizational context, and include other communication technologies, e.g., social networks.

References


Appendix

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<tr>
<th>Demographic</th>
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<th>Demographic</th>
<th>Characteristic</th>
<th>Count</th>
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<td>Educational Background</td>
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<td>169</td>
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Table 1. Demographic data.

<table>
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<tr>
<th>Accessibility (A)</th>
<th>7-point Likert (1 = strongly disagree; 7 = strongly agree)</th>
<th>(Bruque, et al. 2008, Chang &amp; King 2005)</th>
</tr>
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<tr>
<td>A1</td>
<td>I have access to the system outside of working hours.</td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>I can easily access the system away from my office.</td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>The system allow me to work from anywhere and at anytime.</td>
<td></td>
</tr>
<tr>
<td>Information Overload (IO)</td>
<td>7-point Likert (1 = strongly disagree; 7 = strongly agree)</td>
<td>(Kock, et al. 2009, Schultze &amp; Vandenbosch 1998)</td>
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<td>IO1</td>
<td>The system increases the likelihood for information overload.</td>
<td></td>
</tr>
<tr>
<td>IO2</td>
<td>I cannot easily handle all the relevant information I receive through the system.</td>
<td></td>
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<tr>
<td>Information Sharing Attitude (ISA)</td>
<td>7-point Likert (1 = strongly disagree; 7 = strongly agree)</td>
<td>(Bock, et al. 2005)</td>
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<td>IS1</td>
<td>I find sharing information with my colleagues in the system enjoyable.</td>
<td></td>
</tr>
<tr>
<td>IS2</td>
<td>I find sharing information with my colleagues in the system valuable and beneficial to me.</td>
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<td>I find sharing information my colleagues the system a wise and future oriented move.</td>
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<td>Motivation (M)</td>
<td>7-point Likert (1 = strongly disagree; 7 = strongly agree)</td>
<td>(Agarwal &amp; Karahanna 2000, Wasko &amp; Faraj 2005)</td>
</tr>
<tr>
<td>M1</td>
<td>I feel good when I help others solve problems with their use of the system.</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>I like to experiment with new systems.</td>
<td></td>
</tr>
<tr>
<td>M3</td>
<td>I enjoy helping others with their use of the system.</td>
<td></td>
</tr>
<tr>
<td>Perceived Usefulness (PU)</td>
<td>7-point Likert (1 = strongly disagree; 7 = strongly agree)</td>
<td>(Brown et al. 2008, Bunduchi 2005, Davis 1989)</td>
</tr>
<tr>
<td>PU1</td>
<td>Generally, the system, save me time with my daily tasks.</td>
<td></td>
</tr>
<tr>
<td>PU2</td>
<td>Generally, the system, give me greater control over my work.</td>
<td></td>
</tr>
<tr>
<td>PU3</td>
<td>Generally, the system, make my job more effective.</td>
<td></td>
</tr>
<tr>
<td>Social Relationship (SR)</td>
<td>7-point Likert (1 = strongly disagree; 7 = strongly agree)</td>
<td>(Markus 1994)</td>
</tr>
<tr>
<td>SR1</td>
<td>By using the system, I build a closer relationship with my subordinates.</td>
<td></td>
</tr>
<tr>
<td>SR2</td>
<td>By using the system, I build a closer relationship with my superiors.</td>
<td></td>
</tr>
<tr>
<td>SR3</td>
<td>By using the system, I build a closer relationship with my peers.</td>
<td></td>
</tr>
<tr>
<td>Control Variable: Use (U)</td>
<td>Number of sessions within six month before the survey (range from 0 to 2657).</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Measurement items.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>AVE</th>
<th>CR</th>
<th>Alpha</th>
<th>A</th>
<th>IO</th>
<th>ISA</th>
<th>M</th>
<th>PU</th>
<th>SR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.69</td>
<td>2.42</td>
<td>0.90</td>
<td>0.96</td>
<td>0.94</td>
<td><strong>0.95</strong></td>
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<td></td>
</tr>
<tr>
<td>IO</td>
<td>4.14</td>
<td>1.57</td>
<td>0.64</td>
<td>0.78</td>
<td>0.47</td>
<td>0.41</td>
<td><strong>0.80</strong></td>
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</tr>
<tr>
<td>ISA</td>
<td>5.46</td>
<td>1.95</td>
<td>0.96</td>
<td>0.99</td>
<td>0.98</td>
<td>0.50</td>
<td>0.68</td>
<td><strong>0.98</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.74</td>
<td>1.89</td>
<td>0.89</td>
<td>0.96</td>
<td>0.94</td>
<td>0.35</td>
<td>0.60</td>
<td>0.63</td>
<td><strong>0.94</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td>4.36</td>
<td>1.78</td>
<td>0.89</td>
<td>0.96</td>
<td>0.94</td>
<td>0.34</td>
<td>0.67</td>
<td>0.68</td>
<td>0.64</td>
<td><strong>0.94</strong></td>
<td></td>
</tr>
<tr>
<td>SR</td>
<td>3.52</td>
<td>1.78</td>
<td>0.92</td>
<td>0.97</td>
<td>0.95</td>
<td>0.26</td>
<td>0.53</td>
<td>0.56</td>
<td>0.56</td>
<td>0.63</td>
<td><strong>0.96</strong></td>
</tr>
</tbody>
</table>

*Table 3.* Means, standard deviations, AVE, composite reliability (CR), Cronbach’s alphas, and correlations among constructs (off-diagonal elements), square root of AVE (diagonal elements).