

Comparing the task effectiveness of instant messaging and electronic mail for geographically dispersed teams in Taiwan

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Abstract

To improve task effectiveness of geographically dispersed teams, media selection approaches a complex issue involving media features and user characteristics. This study compares user perceptions about task effectiveness between instant messengers (IM) and e-mail (EM). Using a field experiment, the design contrasted teams using EM with teams using IM. Thirty-four teams of two graduate students were enrolled as participants from five universities in Taiwan. Two people were separated geographically and had to communicate accordingly. Results indicate that IM-supported teams generated more ideas and task success. However, no significant difference was found in task difficulty between the IM and EM users.

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1. Introduction

While communication media in our lives have been studied extensively, the impacts of media in the geographically dispersed workplace have been largely overlooked. In individual daily life, two forms of popular media used for communication are instant messaging (IM) and e-mail (EM). Many studies have therefore investigated the application of IM [1–3] and EM [4–7]. The most popular IM systems are Yahoo Messenger, Microsoft's MSN, AOL Instant Messenger, and ICQ, which are put to use by many IM users when it comes to this form of communication. Fuller [3] noted that IM is the fastest growing means of communication, while EM has been ubiquitous worldwide. For media characteristics, some scholars [1–3] emphasized IM's synchronous communication and good sense of who is on-line or away.

Other authors [8–11] have discussed EM's distinct features. Despite the two media's rapid growth in popularity, however, studies about IM or EM are seldom systematically combined and evaluated for task effectiveness.

Task effectiveness for an individual or organization is a fundamental goal in making a media selection decision. For example, Mennecke et al. [12] noted that the understanding of consequences associated with the use of a communication medium is critical to the evaluation of many media. From the evolution of comparative research on the choice, use, and impacts of communication media, some studies [5,13,14] focus primarily on improving task effectiveness. Chen et al. [15] also noted that media selection should meet communication contexts. Some studies [16–18] emphasized that media selection must be suitable for task-oriented communication. To achieve task effectiveness improvement, fitting good technological media to a related task has been recognized as an excellent approach.

To consider the media characteristics of technological media and task fit, we adopt the media richness theory (MRT) and task–technology fit theory (TTFT) as lens to examine the media's comparative impacts on task effectiveness. Some studies

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[19–21,18,22–24] have adopted MRT to better explain media's core characteristics. Goodhue and Thompson [25] proposed TTFT and noted technology, in order to have a positive impact on individual performance, must be based on a good fit with the tasks it supports. Furthermore, EI-Shinnawy and Markus [5] noted that a comparison approach, which did not test theories, would lead to the detrimental consequence of overlooking the capabilities of a new communication medium not found in the old medium. Although these two theories may be thought equally applicable to new media [21,18,14,12], this claim has not yet been empirically developed and tested by comparing IM and EM.

Based on MRT and TTFT, we examine the differences between IM and EM. These two media vary in response time, delivery format, ability to transport attachments, and detection of recipient's availability, among others [15]. To guide media selection for task effectiveness, a comprehensive comparison between IM and EM is necessary. The comparison is as follows: (1) IM has a presence awareness/notification component to detect whether or not a co-worker is connected to the Internet. EM does not have this component; (2) IM is often used for the high immediacy of information exchange; EM has slightly lower immediacy of information exchange; (3) IM is more helpful for reducing information uncertainty and ambiguity than EM; (4) in high equivocal situations, IM is more helpful to clarify a message; (5) IM is more rich and provides more use of media symbolism; (6) IM is frequently used in synchronous mode while EM is commonly used in asynchronous mode; (7) IM is highly interactive while EM is highly un-interactive. (8) Feedback in IM is fast though feedback in EM is time-lagged and unpredictable; (9) group memory in EM is easy to obtain. In IM, however, it is not easy to get again.

While media selection in a face-to-face team has been studied extensively, media selection duties to enhance task effectiveness in the context of geographically dispersed teams have been largely overlooked. Johansen [26,27] provided a two-dimensional (group proximity and time dispersion) taxonomy for the computer support of teams. After collecting 200 GSS research experiments spanning 30 years, Fjermestad and Hiltz [28] suggested that future studies focus more on comparison between synchronous and asynchronous time dispersions, as well as more on the geographically dispersed team. Hence, in the context of geographically dispersed teams, this study aims to compare task effectiveness between IM and EM.

The paper is organized as follows. Section 2 reviews related literature, focusing on the comparison of instant messaging and electronic mail, MRT, and TTFT. Section 3 presents the research model and a set of hypotheses. Next, Section 4 describes the research method and data measurement. Meanwhile, analytical results are reported in Section 5. Finally, Section 6 presents the conclusions, as well as a discussion of the implications of the findings of this study.

2. Literature review

The section contained herein focuses on IM and EM background, media richness theory, and task–technology fit theory.

2.1. Instant messaging and e-mail background

Considerable research attention has been focused on the choice, use, and consequences of communication media [29,1–3]. The importance is derived from the proliferation of new media, which has changed the nature of organizational communication in fundamental ways [5].

Instant messaging is a synchronous computer-mediated messaging system defined as a type of communication service that enables the creation of a private chat room with other users. The origin of instant messaging comes from a Finn called Jarkko Oikarinen who created Internet Relay Chat in 1988. The two largest instant messaging services in terms of members are AOL Instant Messenger and ICQ. Today, Microsoft's MSN Messenger and Yahoo! Messenger are the two most popular tools in the instant messaging area [2]. Instant messaging can also use emoticons to transmit an emotional status message.

E-mail is an asynchronous computer-mediated messaging system and is defined as the use of computers to provide information exchange services [4]. For example, Sproull and Kiesler [4] stated that electronic mail not only speeds up the exchange of information but also causes an exchange of new information.

Both IM and EM are popular communication tools on the Internet, with IM rapidly gaining popularity. Chen et al. [15] have noted that (1) IM and EM have been preferred communication media in the workplace, (2) IM follows EM's pattern and both media coexist like telephone and fax.

2.2. Media richness theory

Media richness theory (MRT) has been the focus of many studies related to organizational communication and technology-based communication [18,22,7,30,4]. MRT focuses on media's ability to change a recipient's understanding within a given amount of time. Rich information can change a recipient's understanding more quickly than "lean" information, which will change the recipient's understanding, but will require more time to achieve the same result. However, many factors may affect the ability of a medium to transmit rich information. MRT argues that a medium capable of providing immediate feedback is better than a medium that only provides unidirectional communication, and that a medium that carries more cues (e.g., expressions, gestures, tones, etc.) is a better choice than one that carries fewer cues. Based on these MRT assumptions, e-mail is a leaner medium because it does not support the same level of communication richness offered by other forms of communication such as face-to-face conversation [18]. The main reason for this argument is that e-mail is text-based, and so is incapable of transmitting non-textual cues such as facial expressions, body language, or vocal tones.

To apply MRT, several empirical studies have found inconsistent evidence. For example, some studies demonstrate that EM is a lean medium according to MRT, but is indeed capable of supporting rich information exchange [31,7]. Lee [7] noted that the distinct features of specific medium can determine rich or lean information exchange. The same e-mail tool might

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