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Recommended Citation

Hrastinski, Stefan, "Exploring Informal and Formal Dimensions of Computer-Mediated Communication: Towards An Enhanced Model for Research and Practice" (2008). *ECIS 2008 Proceedings*. 180.

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EXPLORING INFORMAL AND FORMAL DIMENSIONS OF COMPUTER-MEDIATED COMMUNICATION: TOWARDS AN ENHANCED MODEL FOR RESEARCH AND PRACTICE

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Abstract

It has been recognized for many years that informal communication is an important part of effective work and thus vitally important in organizations. However, research on informal dimensions of information systems is rare. In this paper, Fish et al.'s (1990) model that distinguishes characteristics of informal and formal dimensions of computer-mediated communication (CMC) is further developed. The enhanced model is exemplified and tested by analysing three applications of CMC, in which different media are used for different purposes. The applications illustrated that a medium may be more or less useful for supporting informal or formal communication. However, the most important influence on the degree of formality was the task and how the medium was used, rather than the medium itself. It is argued that, even though the model proposed here needs to be further developed, it can be useful as support for researching, choosing and designing CMC of varying degrees of formality.

Keywords: Computer-mediated communication, Social networks, Media choice and use, Online communities.

1 INTRODUCTION

Without doubt the most influential classification of computer-mediated communication (CMC) is the dichotomy of asynchronous and synchronous communication. There is an ongoing debate on useful applications of these two types of communication in various settings. Even though the classification of communication as asynchronous or synchronous is useful, it should be noted that it is the users, and not the technology itself, that decide whether to communicate asynchronously or synchronously. For example, e-mail is sometimes used near-synchronously since users may remain logged in and monitor their e-mail continuously (Haythornthwaite 2000, 2001; Markus 1994). It is likely, however, that some media may be more useful in supporting asynchronous, synchronous or mixed types of communication.

Even though the dichotomy of asynchronous and synchronous communication has been widely used, it is also important to understand other more complex dimensions of CMC. Notably, researchers have proposed many complementing dichotomies. The most common framework associated with asynchronous and synchronous communication is the well-known time/place communication framework (Turban & Aronson 1998). Participants of asynchronous communication may be both geographically and temporally dispersed while participants of synchronous communication may be geographically dispersed but communicate in real-time. Other frameworks include the distinctions between open and closed CMC, and implicit and explicit CMC (Hansen et al. 1999). In open CMC all members of a group participate while closed CMC implies that only some individuals are allowed to participate. Implicit CMC “refers to collaboration through the use of shared information resources, such as documents, images and spreadsheets, whilst ... explicit [CMC occurs] among collaborators using audio and/or video channels, or just simple text messages” (Hansen et al., 1999, p. 172). Frameworks such as these ones help both practitioners and researchers to gain a deeper understanding of how communication media can be used, designed and researched.

It has been recognized for many years that informal communication is an important part of effective work and thus vitally important in organizations (Kraut et al. 1990; Mintzberg 1973; Whittaker, Frohlich & Daly-Jones 1994). The increased emphasis on informal aspects of collaborative work (Wenger 1998) has led organizations to think about whether and how informal dimensions may be supported (Wenger, McDermott & Snyder 2002). For example, Marsick and Watkins (2001) recommend that organizations should support peers to work and learn collaboratively whilst Wenger and colleagues (2002) give guidelines on how informal participation in communities of practice can be cultivated. Hansen and colleagues (1999) compared formal and ad hoc or informal meetings (see Table 1). When studying the advantages and disadvantages of the two types of meetings shown in the table, it seems like the two types complement each other. For example, informal meetings may be useful for generating new ideas while formal meetings may be useful for deciding which ideas to pursue further. This paper contributes by shedding light on how CMC can support informal communication, an issue that has received limited attention in previous research.

	Advantages	Disadvantages
Formal face-to-face meetings	<ul style="list-style-type: none"> - Useful for focusing on the team task - Useful for making decisions - Useful for getting to know one another and building a sense of community 	<ul style="list-style-type: none"> - Involves high cost and use of time - Onerous and/or imperfect record of debate
Ad hoc face-to-face meetings	<ul style="list-style-type: none"> - Useful for developing shared understanding - Useful for generating new ideas together 	<ul style="list-style-type: none"> - Only those that are co-located and have time can participate - Increased sense of distance for those who cannot participate - Danger of not sharing outcomes with the rest of the team

Table 1. *Advantages and disadvantages of formal and ad hoc face-to-face meetings (Hansen et al. 1999, p. 174)*

In the next section, previous research on informal CMC is discussed. Then, an enhanced model of formal and informal dimensions of communication is proposed. In the fourth section, the model is exemplified by describing three applications. Finally, implications of the model and future research challenges are discussed.

2 INFORMAL COMPUTER-MEDIATED COMMUNICATION

Informal conversations “take place at the time, with the participants, and about the topics at hand” (Fish, Kraut & Chalfonte 1990, p. 2). Nardi, Whittaker and Bradner (2000) argue that informal interaction generally is “impromptu, brief, context-rich and dyadic” and “support joint problem solving, coordination, social bonding, and social learning — all of which are essential for complex collaboration” (p. 79). Fish and colleagues’ (1990) developed a model that distinguishes characteristics of informal and formal dimensions of communication (see Figure 1) that will be further developed in this paper.

Formal	←	→	Informal
Scheduled in advance			Unscheduled
Arranged participants			Random participants
Preset agenda			Unarranged agenda
One-way			Interactive
Impoverished content			Rich content
Formal language & speech register			Informal language & speech register

Figure 1. *The formality of communication (Fish et al. 1990, p. 2; Kraut et al. 1990)*

How may informal CMC be supported online? Technologies include different degrees of formality and those that demand a high degree of formality can disrupt informal relations (Brown & Duguid 1998). Thus, one aspect is to identify an appropriate medium since each medium “emphasizes, amplifies, and enhances particular kinds of experience” but “also inhibits, restricts, and diminishes other kinds of experience” (Swan & Shea 2005, p. 253). It is also important to recognize that, even while a medium may seem beneficial in supporting informal communication, it is the users, and not the medium per se, that decide if it is to be used for informal communication. Introducing a medium will only provide an opportunity, but if the users do not feel a need or motivation to use the medium it will of course not enable communication (Marsick & Watkins 2001).

An early attempt of developing technology that supports informal communication over a network is from 1985. A group of researchers at Xerox’s Palo Alto Research Center was divided into two subgroups. One of the groups remained at the research center in California while the second one was moved to Portland, Oregon. However, the members were able to communicate with each other informally through “video walls” located in common areas, such as coffee rooms (Smith 1994). A similar technology, the VideoWindow, was developed during about the same time (Fish et al. 1990). When using these technologies, the employees could communicate with other employees at the other site when they were in any of the common areas equipped with video technology.

A recent example of asynchronous informal CMC is interest-based online learning communities. For example, communities of geographically dispersed programmers continuously enhance their programming skills by helping each other in discussion groups. An example of synchronous informal CMC is the use of instant messaging at work (Hrastinski 2007a). The medium is often used for spontaneously asking specific work-related questions (Cho, Trier & Kim 2005) and characterized by an informal tone (Cameron & Webster 2005).

3 FORMAL AND INFORMAL DIMENSIONS OF CMC: AN ENHANCED MODEL

In this section, it is described how Fish et al.'s (1990) model on the formality of communication has been further developed (see Figure 2). The enhanced model is described below. In the next section, the model is used to describe three applications of CMC with a varying degree of formality.

Formal	←	→	Informal
Scheduled			Unscheduled
One-way			Interactive
Preset agenda			Emergent agenda
Mandatory			Optional
Authority-organized			Participant-organized
Content-focus			Experience-focus
Formal language			Informal language
High cost			Low cost

Figure 2. Formal and informal dimensions of CMC

Parts of Fish and colleagues' (1990) model seem to still be relevant today and have therefore remained unchanged. These are the variables of *scheduled vs. unscheduled* and *one-way vs. interactive*. In the initial model there was a pair of variables that has not been included: *impoverished vs. rich content*. As discussed above, recent research suggests that text-based or "impoverished" communication (e.g., instant messaging) may enable informal communication (Cameron & Webster, 2005; Nicholson, 2002). The remaining variables of the model are new or have been modified:

- *Preset vs. emergent agenda*. The latter variable was modified from unarranged agenda to emphasize that the agenda may emerge during informal conversations, which is exemplified in section 4.3.
- *Mandatory vs. optional*. In the initial model, one pair of variables was arranged participants and random participants. However, since CMC in organizations seldom occurs with random participants, the pairs of mandatory and optional were preferred. The new pair encompasses the variables from the initial model: There are arranged participants in a mandatory discussion since, for example, employees may be expected to participate in an online meeting.
- *Authority-organized vs. participant-organized*. This pair of variables emphasizes that an authority, such as a manager or project leader, may organize online communication. However, as argued earlier, informal conversations typically occur spontaneously and are thus organized by the participants themselves.
- *Content vs. experience focus*. Online communication ranges from being focused on the task to being focused on personal ideas and experiences (Haythornthwaite, 2002). Since informal communication is described as impromptu and context-rich (Nardi, Whittaker & Bradner, 2000), it is assumed as more likely that such communication is characterized by an experience focus.
- *Formal vs. informal language*. In the initial model, a pair of variables was entitled "formal language and speech register" and "informal language and speech register" but these have been simplified.
- *High vs. low cost*. Kraut and colleagues (1990) suggested four characteristics of technology for informal communication: (1) Provide access to a suitable population of others, (2) An environmental mechanism that brings people together, (3) The "cost" of communication needs to be low, and (4) A visual channel which provides a means for recognizing the presence of another person, determining who they are, and assessing their availability for interaction. By drawing on these characteristics, the pair of high cost vs. low cost was introduced to assess how easy it is to engage in a conversation with others.

4 EXAMPLES OF FORMAL AND INFORMAL DIMENSIONS OF CMC

In this section, the proposed model will be applied empirically by using data from a series of studies on two online courses (Hrastinski, 2006; 2007b). Three examples of media use will be presented: the use of chat and discussion board as support for online discussions and the use of instant messaging as support for group work. The reason for including these examples is not to argue that one medium is more or less formal in itself since this is dependent on how a medium is used. Instead, the examples are used to illustrate and test whether the model is useful for understanding formal and informal dimensions of CMC.

In the first two examples, selected experiences from studies of an online course on knowledge management are summarized. The course was mainly delivered through online discussions where text-based media were used. These were usually scheduled weekly and discussion board was used. Moreover, three discussions were conducted in real-time by chat. The data presented here were collected following two asynchronous discussions and two synchronous discussions that were conducted during the middle of the course. In the online discussions, the students and a teacher discussed knowledge management literature.

4.1 Example 1: Chat as support for online discussions

All students were asked to submit a questionnaire following the second and third synchronous discussions. In sum, there were 34 participants in the two discussions, and 31 of them (91%) completed the questionnaire. In each questionnaire, the students were asked to report which others they had communicated with during the discussion. Figure 3 shows a graph or sociogram that illustrates the results, which was created using the software Ucinet 6 (Borgatti, Everett & Freeman, 2002). Adjustments were made for missing data by taking others' responses. The sociogram shows that students maintained many relations with others in these discussions. During the course, students were expected to complete two group projects. However, the perceived exchanges were not limited to the project groups.

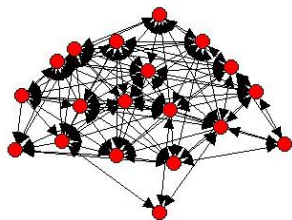


Figure 3. Social network of the online discussions by chat

This seems to be an example of neither formal nor informal communication. In Figure 4, the case has been analysed by using the variables of formal and informal communication proposed above. The model gives several explanations for the high density of the social network of Figure 3. The discussions were *scheduled* and *mandatory*. Thus, on a certain date and time students were expected to be prepared and to participate. Moreover, the discussions were *authority-organized* and followed a thorough *preset agenda*. By using a detailed agenda, the teacher made sure that each student communicated with as many other students as possible in small group discussions.

There was neither a *content-focus* nor an *experience-focus*. Instead, knowledge management literature and how it relates to the work experiences of the students were discussed. The synchronous discussions were experienced as *interactive*, because discussions were conducted in real-time. This configuration made the students feel confident that there would be a reply when asking a question. The decision to also emphasize the experience of students may have supported them to form personal relations by sharing personal experiences. *Informal language* was used, which seems to have

contributed towards creating personal relations among students, as shown in the following chat transcript:

Anne> VERYGOOD
 John> very good, we have done well
 Anne> jihoo, and I am still awake;))
 John> excellent, I am hoping to have a cup of coffee soon
 Lisa> Well, to make it in time the discussion is finished and we go back to the big chat room
 Lisa> Thanks for that you've done so well

Social communication (e.g., greetings) was very common in the beginning and end of the discussions and group discussions. The chat provided awareness of who is online, which may have helped to bring students together and the *cost* of communication was quite low – the students needed only to write a line of text and then press enter. By scheduling mandatory discussions, access was also provided to other students.

Formal	←	→	Informal
Scheduled	√		Unscheduled
One-way		√	Interactive
Preset agenda	√		Emergent agenda
Mandatory	√		Optional
Authority-organized	√		Participant-organized
Content-focus		√	Experience-focus
Formal language		√	Informal language
High cost		√	Low cost

Figure 4. Formal and informal dimensions of the online discussions by chat

4.2 Example 2: Discussion board as support for online discussions

All students were asked to submit a questionnaire following two of the asynchronous discussions. In sum, there were 38 participants in the two discussions, and 32 of them (84%) completed the questionnaire. As described above, the students were asked to report which others they had communicated with during the discussion. Figure 5 shows a sociogram that illustrates whom each of the students perceived that they communicated with. The sociogram illustrates that students maintained almost as many relations with each other in these discussions as in the synchronous discussions.

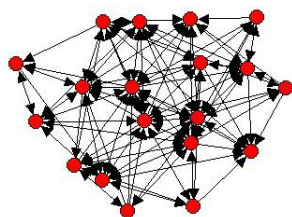


Figure 5. Social network of the online discussions by discussion board

This seems to be an example of quite formal communication. In Figure 6, the case has been analysed using the variables of formal and informal communication. The model gives several explanations for the rather high density of the social network of Figure 5. The discussions were *mandatory* but were not *scheduled* in a traditional sense, i.e. during a short time period. Instead, the discussion was scheduled for a week. During this week, the students were expected to contribute with a specified number of postings. However, different students wrote their postings at different times during the week. This

might be an explanation for the slightly lower number of maintained relations as compared with the discussions by chat.

The discussions were partly *authority-organized* and partly followed a *preset agenda*. The teacher initiated the discussions by suggesting questions for discussion and also tried to stimulate *interactive* discussion. There was an agenda, i.e. the literature on which to base the discussions, questions to discuss, and requirements for the number of postings that student were to submit, but not a detailed agenda as in the synchronous discussions.

There was neither a *content-focus* nor an *experience-focus*. As in the synchronous discussions, sharing personal experiences may have supported the students to form personal relations by sharing personal experiences. The students used *formal language*, as indicated by the following example from the online discussions by discussion board:

There have been many postings for this subject and it seems like the general view, which also is supported by Davenport & Prusak, is that a knowledge map displays the knowledge that exists within the organization.

The discussion board did not provide fast access to other students and the *cost* of communication was high since students often put a lot of effort into their postings and used formal language.

Formal	←	→	Informal
Scheduled		√	Unscheduled
One-way		√	Interactive
Preset agenda		√	Emergent agenda
Mandatory	√		Optional
Authority-organized	√		Participant-organized
Content-focus		√	Experience-focus
Formal language	√		Informal language
High cost	√		Low cost

Figure 6. *Formal and informal dimensions of the online discussions by discussion board*

4.3 Example 3: Instant messaging as support for online group work

In the third example, selected experiences from an online course entitled Business English Online are summarized. The course did not include any on-campus meetings. It has traditionally been delivered asynchronously and participants have communicated mainly via e-mail and discussion boards. One recurring problem has been to get students to work in groups since waiting for answers from their group members have caused a common feeling of annoyance (Lindh, Hrastinski & Soames, 2005). To try to make it simpler for students to communicate with each other, without having to wait too long for answers, an instant messaging (IM) system was introduced. IM is mainly designed for synchronous communication and can be used to maintain a list of “friends”. These friends can be contacted, when being online and running the software, by sending text messages or initiating a chat, audio or video conferencing session. The IM system was associated with an introductory activity that was mandatory. During the remaining course, using the IM system was voluntarily. The course was delivered over ten weeks.

At the end of the course, the students were asked to submit a questionnaire that investigated how often they had communicated with each other student by IM during the ten-week period. By using the resulting data, a sociogram that illustrates which students that felt they had communicated at least once during this period was constructed (see Figure 7). During the course, the students were expected to complete a group project. The task was to devise gap-fill exercises, which then was used to test another group on how tenses work in English. The initial letter of each node denotes which group each student belonged to – there were four groups (A-D). From the sociogram it is clear that the students

mainly used IM to communicate with their group members. In fact, few pairs crossed the group boundaries.

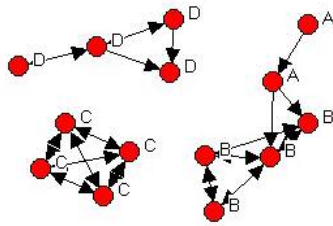


Figure 7. Social network of group work by IM

This seems to be an example of quite informal CMC. In Figure 8, the case has been analysed by using the variables of formal and informal communication. The model gives several explanations for the low density of the social network of Figure 7. The online discussions were *optional*, which explains why the students did not maintain as many relations as in the two examples above. Some of the conversations by IM were *scheduled* while others were *unscheduled*. One of the groups chose to schedule group meetings while the other groups mainly used IM as support for spontaneous unscheduled. The meetings were *participant-organized*. Even when a meeting was scheduled, the *agenda* seemed to emerge during the meetings in an *interactive* fashion, even though the participants had some idea of what to discuss

One might have guessed that there was an *experience-focus* since the meetings were participant-organized. However, except for brief social exchanges in the beginning and end of conversations, students were focused on content. As indicated by the social network, IM was mainly used to support group work where students constructed English gap-fill exercises. Thus, as in the previous two examples, the task was more important than the medium itself in influencing the formality of discussions.

The students used *informal language*, which also may have contributed towards creating a sense of community among group members (Hrastinski, 2006) as shown in the following IM transcript:

```
Linda> Hi Tomas! Everything fine with you?
Fredrik> Hi Linda. Great, yourself?
Linda > Well, it starts to get better now!
Linda > I have sent the letters to you and Mats with comments.
Fredrik> I looked at your letters. Haven't had time to write as thorough as you, sorry. :$
Linda > Oh what a cute [smiley], you are forgiven!
```

IM seems particularly useful in supporting informal communication since it provides awareness of who is online, which may have helped to bring students together. As when using chat, the *cost* of communication was quite low – the students needed only to write a line of text and then press enter.

Formal	←	→	Informal
Scheduled		√	Unscheduled
One-way		√	Interactive
Preset agenda		√	Emergent agenda
Mandatory		√	Optional
Authority-organized		√	Participant-organized
Content-focus	√		Experience-focus
Formal language		√	Informal language
High cost		√	Low cost

Figure 8. Formal and informal dimensions of group work by instant messaging

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