

# CHAPTER XX

## THE ROLE OF CONTEXTUAL CLUES IN THE CREATION OF INFORMATION OVERLOAD

Chris Kimble<sup>(1)</sup>, David J. Grimshaw<sup>(2)</sup>, Paul M. Hildreth<sup>(1)</sup>

<sup>(1)</sup> MIS Research Group, Dept. Computer Science, University of York. <sup>(2)</sup> School of Management, Cranfield University.

### ABSTRACT

*There has been an explosion of new forms of communications media for interpersonal communication. There is anecdotal evidence of people suffering from 'information overload' as a result of these developments. This paper presents the results from, and analysis of, a case study of a perceived problem of information overload from e-mail in a large international organisation: Watson Wyatt Partners. The research took two approaches to exploring the problem. The first was a survey of 1500 members of staff in the UK and Europe. This was aimed at collecting factual information. The second approach was to conduct follow up interviews with 19 people at two sites in the UK to explore some of the issues raised by the survey in greater depth. In the paper, we argue that for CMCs (Computer Mediated Communications) to be effective there is a need to establish a 'context' in which the message can be interpreted. In doing so we will demonstrate that ignoring the degree of 'context' a media provides can adversely affect the users perceptions of that media.*

### 1 INTRODUCTION

The nature of information and communication technologies in the office environment is changing. Business pressures, such as competition and globalisation, together with technological developments and the convergence of computer and communications technology have lead to an explosion of new and diverse forms of technology. Although

C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. Matching Technology with Organisational Needs, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9

electronic mail (e-mail) is perhaps the most high profile of these new technologies voice mail, fax, video conferencing and 'shared whiteboards', together with the telephone, paper memos and face to face meetings, are all media through which internal and external communication might take place. CMCs, such as e-mail, changes in the nature of work, such as teleworking, and mobile communications, claim to encourage a more efficient use of time and flexible working patterns.

Viewed in technological terms all CMCs are essentially about either the transfer or sharing of data. For machine to machine communication this does not pose any particular problems. However, for human to human communication to be successful there is a need to supply a context to transform the data into information. In face to face communications, this happens quite naturally. However, in electronic communications many contextual clues are missing. Grimshaw *et al* (1997) focus on the concept of context as a key to transforming machine data into human information. They argue that:

Taking Wilson's (1984) definition of information as data plus context we conclude that meaning is conferred in a particular context. Here, context is discussed in relation to meaning, highlighting problems where failures in communication, or 'breakdowns' occur.

We begin our analysis of how one form of CMC (e-mail) is used starting from two premises. The first is that for two people to undertake any form of communication, they first need to establish a measure of shared understanding: a conceptual common ground.

Although analytically complex, face-to-face interaction is probably the most readily appreciated example of this. Face-to-face communication is an activity that involves far more than just words. Clark and Brennan (Clark & Brennan 1991) for example argue that during a communication activity participants will constantly update their 'common ground' using some form of grounding process. Examples might include participants use of visual cues such as looking and pointing (Clark 1996).

The process of adjustment and change is usually invisible to the participants because it works so smoothly. The failures that do happen are experienced as 'breakdowns' in communication and mutual understanding (Winograd & Flores 1987). An example of such a breakdown in electronic mail might be that of flaming (Corbett 1997, Markus 1994).

The second premise is that all forms of communication are, in some form, mediated communication. At the perceptual level Mingers (Mingers, 1995) argues that we interpret events through a process of 'digitalisation' that abstracts only a proportion of the information carried by the event in the physical world. We stress here that we are not arguing some form of media determinism such as McLuhan's (McLuhan, 1964) 'The Medium is The Message' but simply that any form of communication may be considered as mediated communication.

Linguistic and philosophical research has suggested that the interpretation of utterances

C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. Matching Technology with Organisational Needs, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9

depends not on isolated sentences but on the context, or holistic texts (Wiebe et al, 1996). Wittgenstein, for example, asserts that we can only make sense of utterances and actions by seeing them within the contexts in which they were uttered or undertaken: what I do and say is comprehensible only within a given context. The process of refinement of meaning takes place gradually as the content and context are revealed and understood.

When considering CMCs it is perhaps more obvious that different forms of media impose different constraints. Each communications medium clearly has characteristics that make it more suited to one task than another. Clark and Brennan for example, argue that the grounding process changes depending on the communication medium used (Clark & Brennan 1991). Similarly, previous studies have shown that knowledge workers will choose one form of communication media over another depending on the task (Jones & McLeod, 1986; Rice 1987). As Rice (1987) indicates:

*“... it is perhaps more useful to conceive of media as having different degrees of various communication characteristics than to describe some media as more deficient than others”*

In this paper we will examine perhaps the oldest and most widespread example of a CMC. Electronic mail, perhaps because it is the most established of the CMC technologies, has received the most attention. Although other CMCs are now coming to the fore such as video (Adler & Henderson 1994, Tang & Rua 1994) and voice mail (Chin 1996) the use of e-mail continues to change and develop.

Academic work has tended to focus on the shortcomings of e-mail such as the lack of information richness and social presence (Rice 1987, Rice & Shook 1990). Social Presence is the degree to which a communication medium conveys the physical presence and non-verbal and social cues of the participants ... information richness, the extent to which media are able to bridge different frames of reference, make issues less ambiguous, provide immediate feedback, transmit multiple cues, involve several senses, transmit language variety, or provide opportunities for learning in a given time interval.

The implication is that media that lack information richness and social presence do not provide the contextual cues necessary for ‘quality’ person to person communication. Others argue, however, that in text based media such as e-mail, people provide contextual clues by developing new linguistic devices e.g. emoticons (Rivera, Cooke & Bauhs, 1996) or by appropriating traditional concepts such as marking.

Linguists use the term ‘marked’ to denote the way language changes meaning by adding something, for example the use of *le* and *la* in French to denote gender. Sociolinguists have used the ‘marked’ concept to help explain, for example, the ways in which women in the workplace are often ‘marked’ out from men by virtue of the clothes, conversational

C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. Matching Technology with Organisational Needs, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9

styles and attitudes (Tannen 1995).

It is the authors' view that an analysis of a medium's ability to provide 'context' is a useful framework with which to interpret empirical studies of the use of electronic mail. What follows is the results from, and analysis of, a case study of the use of e-mail in a large international organisation of knowledge workers.

## 2 RESULTS

This study arose from a letter circulated to Universities in February 1997 by Watson Wyatt Partners seeking help with a problem of 'information overload'. The research took two approaches to exploring the problem: a survey, collecting factual information and interviews to explore the issues raised by the survey in greater depth.

The survey was sent to 1500 staff (UK and Europe) in May 1997. 567 (37.8%) of questionnaires were returned. The survey addressed the topic of possible information overload from the eight different communications media present in the organisation<sup>1</sup>. The results indicated that e-mail was the predominant communications media of respondents, with 98% of respondents using it sometimes or frequently.

The findings of the survey also helped to clarify the problem of information overload. In particular, it provided important insights into the use of e-mail: principally that information overload only appeared to be a problem experienced by a minority of staff.

Most people (81%) receive 20 or less e-mails per day with only 0.5% receiving over 50 per day. The pattern of sending messages is similar with 93% sending up to 20 messages per day and only 6% sending between 20 and 50 messages per day. Most people spend less than an hour per day on e-mail (85%); only 3% spend over 2 hours per day on e-mail. However, although the numbers of e-mails sent and received were quite low, a large proportion of respondents (90%) felt they received unnecessary e-mail messages.

The mean volume of unnecessary e-mail was 25% of the total e-mail received, although further analysis showed that the median figure was only 10%. Thus, most e-mail users receive only 2 or 3 unnecessary e-mails per day.

When using e-mail set-up costs are low and it is quick and easy to send a message. Thus, incorrectly addressed mail may be one source of the problem. This, however, did not appear to be the case in Watson Wyatt. Further analysis of the organisation by its formal structure showed that people at the higher levels of the organisation received a greater proportion of what they considered to be unnecessary e-mail.

---

<sup>1</sup> Electronic mail, Voice mail, Videoconferencing, Collabshare (Groupware), an Intranet, Fax, Paper, Face-to-Face

Following the survey, interviews were carried out with 19 staff at two sites. Each interview followed a semi-structured format. With the consent of the interviewee all sessions were recorded and transcribed.

The existence of inappropriately addressed e-mail was a source of irritation to all the people who mentioned it. An interesting point however, was that the same two examples, news of a member of staff leaving being sent to the whole country and of a request for a video, were given repeatedly. This raised the question as to how frequent this problem really was.

Watson Wyatt has set up pre-defined group names, W-Lists, that allow one person to mail a large number of individuals using a single e-mail address. Both of the examples above appear to be linked to inappropriate use of these W-lists. The interviewees varied greatly in their skill in using the lists.

*Interviewee 2: "I have lots of W-lists set up so that I can send one e-mail to a group of people"*

*Interviewee 17: "I still find them fiddly to know who's on what list, so if I want to circulate something to 'a group', it's not as clear as it should be ... people don't effectively know who are on those lists"*

The use of W-lists also makes senior members of staff more accessible than would previously have been the case:

*Interviewee 15: "There is the other aspect that people will use e-mail and send messages to people who they would never dream of sending a memo to"*

Of the 19 interviewees only three specifically felt they had a problem with information overload from e-mail. The first example was not a problem with the volume of e-mails but with their content - the messages needed urgent action and could take some time.

*Interviewee 16: "... it's not how many you get, it's how many you have to reply to and how much action. You can get a one line e-mail which actually generates a month's worth of work"*

The second case involved a member of staff in a managerial position whose name was well known to other members of staff. Essentially, people found it easier to short circuit formal organisation procedures and e-mail him directly.

*Interviewee 12: "I think I am overloaded with e-mail because people know my position and if they have a problem they can e-mail straight away"*

C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. Matching Technology with Organisational Needs, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9

The misuse of the 'cc' facility has been suggested as a source of unnecessary e-mail. To some extent this view was supported in the case study, but there were conflicting views expressed. It was seen by most interviewees as a useful facility:

*Interviewee 19: "... if you feel it is of interest to anyone else you can copy them in at the same time"*

The concern was also voiced that it was used too easily:

*Interviewee 1: "People will e-mail [X] about things he really does not want to know about, which they could deal with, and really does not need to go up to his level ... I think because people can just add his name as a 'cc'. They just do it - it is too easy"*

*Interviewee 5: "It is important that they do get to hear information, but, to a certain extent, people just say that they will copy practice administrators in and then we will have covered our backsides"*

On the other hand the opinion was expressed by some people that they prefer to be copied in information, so that they could decide whether it was relevant or not:

*Interviewee 2: "... sometimes people copy me in unnecessarily but it is up to me to decide whether it is necessary or not ... I would rather that than they did not copy me in at all"*

*Interviewee 21: "... I would rather receive it and then I will make a decision whether to file it"*

The final example from the interviews also concerns the appropriateness of the e-mails received. The interviewee was a secretary working for two senior members of the company. She was used as a 'human filter' and was therefore faced not only with mail intended for her, but also that intended only for her superiors.

*Interviewee 1: "People send [Y] quite confidential e-mails. I have seen e-mails with people's salaries included in them, and a lot more of other things besides"*

### 3 CONCLUSIONS

Looking at the results of the empirical study we can see that, in quantitative terms at least,

C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. Matching Technology with Organisational Needs, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9

the perceived problem of information overload, in terms of volume, was not as large as was first thought. The results of the survey suggest that 'unnecessary e-mail' does not normally constitute a large proportion of people's e-mail; in Watson Wyatt, it appears to be more of an irritation than a problem as such.

Although most people at Watson Wyatt saw e-mail as beneficial there was one area in which problems did exist: the use of group mailing. The interviews suggest that a source of unnecessary e-mail was the use of e-mail as a broadcast medium through W-lists. It was not clear however how widespread this problem really is.

The examples of the retirement and the video illustrate that the problem lies with people not understanding the context into which their message will be put. A message that is entirely appropriate in one context, a single office, is perceived as hopelessly inappropriate when broadcast nationally.

A similar problem was experienced by senior managers where a 'cc' had been used to inform a higher level of the organisation. Both the survey and the interviews suggested that there may be a problem with the misuse of the 'cc' function.

Once again, this can be interpreted as a mismatch in context. While some managers felt this was a normal and appropriate use of e-mail, others felt that it was information provided in the wrong setting. Again, the reason behind the failure was a lack of appreciation by the sender of the context in which the message would be received.

The cases of the interviewees who specifically identified themselves as suffering from information overload may be interpreted in a similar way. In the first case, the senders did not appear to appreciate the context in which the message would have to be acted upon - a one line e-mail generates a month's work.

The second case involves a more subtle form of context as, by asking the interviewee to solve their problems directly, the senders of the mail were stepping outside established, formal, organisational procedures. As with the use of the 'cc' function, the way in which the message will be interpreted will depend on the individuals involved in the transaction.

In the final case, the recipient, a secretary, received e-mail for her two bosses. Unlike the W-lists, the recipient was an individual who had a single e-mail address, but it was clear that some senders had confused the address with the person for whom the mail was intended. People would send information intended to be seen by a certain person in certain context, seemingly quite unaware that it would be seen by his secretary in another.

The authors believe that this case study has indicated the importance of the consideration of context in interpersonal CMC. They believe that it also demonstrates that ignoring context can adversely affect the user's perceptions of the information the media provides.

C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. *Matching Technology with Organisational Needs*, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9

**REFERENCES**

- Adler A & Henderson A. (1994). A Room of Our Own: Experiences from a Direct Office Share. In Abelson B, Dumais S & Olson J (eds.), *CHI 94*, 138-144.
- Berghel H. (1997a). Cyberspace 2000: Dealing with Information Overload. *Communications of the ACM* Feb. 1997, Vol. 40, No 2.
- Berghel, H. (1997b). E-mail - The Good, The Bad, and The Ugly, *Communications of the ACM*, Vol. 40, No. 4, 11-15.
- Chin J. (1996). Personality Trait Attributions to Voice Mail User Interfaces. In Tauber M (ed.), *CHI96*, 248-9
- Corbett, J.M. (1997) Wired and Emotional, *People Management*, 26 June 1997, 26-32.
- Crook, C.W. & Booth, R. (1997) Building Rapport in Electronic Mail Using Accommodation Theory, *SAM Advanced Management Journal*, Winter 1997, 4-12.
- Denning, P. (1982). Electronic Junk, *Communications of the ACM*, Vol. 25, No. 2, 163-165.
- El-Shinnawy, M. & Markus, M.L. (1997). The Poverty of Media Richness Theory: Explaining People's Choice of Electronic Mail vs Voice Mail, 443-467.
- Grimshaw, D.J. Mott, P.L. & Roberts, S.A. (1997). The Role of Context in Decision Making: Some Implications for Database Design, *European Journal of Information Systems*, Vol. 5, No. 4, 113-122.
- Jones, JW & McLeod, R. (1986). The Structure of Executive Information Systems: An Exploratory Analysis. *Decision Sciences*, Vol. 17, 1986. 220 - 249.
- Lewis, D. (1996). *Dying for Information*, Reuters Business Information, London.
- Markus, M L. (1994). Finding a Happy Medium: Explaining the Negative Effects of Electronic Communication on Social Life at Work. *ACM Transactions on Information Systems* Vol. 12, No 2, 119-149.
- McLuhan, M. (1964). *Understanding Media: The extensions of man*. New York: McGraw-Hill, 1964.
- Mingers, J.C. (1995). Information and meaning: foundations for an intersubjective account. *Journal of Information Systems* Vol. 5, 1995, 285 - 306.
- Negroponte, N. (1995). *Being Digital*, Random House, New York.
- Ngwenyama, O.K. & Lee, A.S. (1997). Communication Richness in Electronic Mail: Critical Social Theory and the Contextuality of Meaning, *MIS Quarterly*, June, 145-166.
- Rice, R (1987). Computer Mediated Communication and Organizational Innovation. *Journal of Communication*. 37 (4), 65 - 94.
- Rice, R & Shook D. (1990). Relationships of Job Categories and Organizational Levels
- C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. Matching Technology with Organisational Needs, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9



- to Use of Communication Channels, Including Electronic Mail: A Meta-Analysis and Extension. *Journal of Management Studies*, 27 (2), 195 - 229.
- Rivera, K. Cooke, N. & Bauhs J. (1996). The Effects of Emotional Icons on Remote Communication in Tauber M (ed.), CHI 96, 99-100.
- Rudy, I.A. (1996). A Critical Review of Research on Electronic Mail, *European Journal of Information Systems*, 4, 198-213.
- Shade, L.R. (1996). Is There Free Speech on the Net? Censorship in the Global Information Infrastructure. In Shields R (ed.) *Cultures of Internet*. Sage, p 15.
- Street, R.L. & Giles, H. (1982). Speech Accommodation Theory: A Social Cognitive Approach to Language and Speech Behaviour, in: M.E. Roloff & C.R. Berger (Eds.) *Social Cognition and Communication*, Sage, 193-226.
- Tang, J & Rua, M. (1994). Montage: Providing Teleproximity for Distributed Groups. In Abelson B, Dumais S & Olson J (eds.), *CHI 94*, 37-43.
- Tannen, D. (1995). *Talking from 9 to 5*, Virago Press, London.
- Thompson, A. & Harowitz, S. (1996) Taking a Reading on e-mail Policy, *Security Management*, November 1996, 55-58.
- Weisband, S.P. & Reinig, B.A. (1995). Managing User Perceptions of E-mail Privacy, *Communications of the ACM*, Vol. 38, No. 12, 40-47.
- Wiebe, J., Hirst, G. & Horton, D. (1996). Language Use in Context, *Communications of the ACM*, 39(1), 102-111.
- Wilson, B. (1984). *Systems: Concepts, Methodologies and Applications*, John Wiley & Sons, Chichester, Second Edition.
- Winograd, T. & Flores, F. (1987). *Understanding Computers and Cognition*. Addison-Wesley, Reading, Mass.

C. KIMBLE, P. HILDRETH & D. GRIMSHAW. - The role of contextual clues in the creation of Information Overload. Matching Technology with Organisational Needs, Proceedings of 3rd UKAIS Conference, April 1998, Lincoln University, McGraw Hill, pp 405 - 412. ISBN 0 07 709454 9