THE USE OF COMPUTER MEDIATED COMMUNICATION IN CONSTRUCTION PROJECT COMMUNICATION

Chris Hill[1]

Sheffield Hallam University, Pond Street, Sheffield, S1 1WB, UK

Communication between different parties in a construction project has always been vital, and also problematic. This paper describes the use of multiple media, including Computer Mediated Communication between two parties to a construction project. The usage, as described, shows how the technical affordances of the computer and other facilities have been appropriated by the participants to overcome practical problems. Further, the description includes an evaluation of the efficacy of the communication processes in achieving the given purpose of the process, as well as unexpected or supplementary outcomes, such as social networking. The technical advances of various facets are involved: cameras, mobile telephones, land line telephones, computers and the internet are all included in this process. These advances cannot be seen as being driven by the demand for new means of communication, but rather the technology has been adopted to achieve the shared goals of the participants. That these participants are geographically separated and economically and contractually distinct is merely a contextual variable which the communication processes are able to surmount. The report was prepared using participant observation methodology, with the author embedded within the company for an extended period.

Keywords: affordance, appropriation, communication, computer mediated communication.

INTRODUCTION

The importance of communications in construction projects has long been recognised, with the important characteristic present in construction of inter- organisational communication (Faisol et al 2006). Construction projects invariably involve a number of disparate parties, often economically and geographically separated from one another (Winch 2002). The coordination of these parties becomes one of the central features of project management. Further, for successful projects, the lead-in period before work is commenced is vital to predict accurately the amount of time and effort required to overcome possible problems.

> *"Due to the rather fragmented nature of the construction industry, most teams are made up of designers and contractors who are employed by different companies and who work in locations remote from the construction site"* (Emmitt and Gorse 2007:24) reporting findings of Abadi (2005)

Communications between the different parties is one of the means by which such problems may be foreseen collectively, and strategies developed to cope with them (Winch 2002). The development of new communications technologies allows ever

---

[1] c.j.hill@shu.ac.uk

---

more sophisticated communications to take place across any distance, and with the opportunity for asynchronicity (Thurlow *et al.* 2004).

> *"Information may come from a variety of sources and will be encoded in a variety of media."* (Emmitt and Gorse 2003:129)

Further as noted by Emmitt and Gorse, the forms of message and the media through which they will be transmitted will be various. Accepting the centrality of communication to the efficacy of the construction process, it is important to emphasise that many meanings of the term communication are available. One commonly accepted meaning sees communication as the transmission of a message for some effect (Gill and Adams 2002). This is termed the 'process' view of communication. An alternative view sees communication as a social act which itself establishes meaning and sense. (Fiske 1990). Rather than concentrate solely on one alternative or the other, this paper will rely on a combination of both meanings or pragmatic understanding (Gill and Adams 2002). Thurlow et al (2004) combine the two understandings well:

> *"Even though people still like to think of communication as the exchange of messages between senders and receivers, communication is really about negotiation of meaning between people. Most theorists would agree that communication simply cannot happen outside human social interaction."* (Thurlow *et al.* 2004:17-18)

COMPUTER MEDIATED COMMUNICATION

Computer Mediated Communication is any communication which uses computer technology as a means of transmitting the message. (Thurlow et al 2004). This can include digital photographs, emails, mobile telephone technology, attachments of files to emails and land line telephones. All are reliant on digital technology for their effectiveness.

> *"Information technology, with its associated fields of telecommunications and microelectronics, has revolutionised the ways in which information is managed and people communicate within industry."* (Dainty et al 2006:192)

Although the construction industry is still seen as to a certain extent reluctant to adopt new technologies, the market penetration of personal computers, digital cameras, mobile telephones makes such observations obsolete. Indeed it is the usage such common technology is put to which is of importance to this paper.

Affordances

The technical affordances of these technologies are well known and understood, and indeed very widely practiced. Emails allow the transmission of a message when the whereabouts of the recipient in unknown. Emails can have files in the form of pdf, document or photographic images, attached to them for immediate transmission. These files can then be opened remotely by the recipient, viewed, stored electronically or printed to hard copy. Emails can be accessed on a variety of equipment, both portable or desktop based.

It should be noted that all of these technical affordances have only become commonplace in the last decade, although many were available long before that

In common with other forms of Computer Mediated Communication, emails allow communication without face to face contact and thus removes the non verbal

communication which can act as clues or cues. This in turn has been identified as a positive advantage for users who find they are able to be more open or direct in their communication than by other means (Thurlow 2002).

Appropriation

The appropriation of technical opportunities has been a characteristic of the whole area of Computer Mediated Communication. Certainly, the use of emails to convey significant amounts of messages in the commercial world, including construction, is apparent. The affordance of asynchronicity, multiple attachments and the creation of 'trails' of messages to allow subsequent records to be kept, have all been seen as significant advantages. The importance for this study is the use of multiple communications media simultaneously. The emails with attachments, the telephones and the printed documents have all been called upon for the communication.

> *"New ways of working based around developments in MIS (management information systems) have placed greater emphasis on the ways in which people exploit the increasing opportunities presented by ICT''*. (Dainty et al 2006:192

These ways of working have been further adopted by small and medium enterprises, or SMEs who would not have their own dedicated ICT (Information and Communication Technology) staff, rather they have become commonplace in the public at large.

> *"Different communication media are evolving, the speed and styles used to transfer information are changing"* (Emmitt and Gorse 2003:117)

Social Interaction

Thurlow describes a study of UK students (2002) in which he identified social interaction as being the dominant usage of elements of CMC such as SMS texting (Short Message Service). This further expands the notion of the possibilities of the CMC usage, and indeed the notion of communication itself.

In common with other computer mediated communication systems, emails and telephones are seen not as a barrier to effective social interaction, but rather as an alternative and reinforcing means to carry out social interaction. The instances in which social interaction takes place may be less face to face, and more remote, using the available means of communication (Thurlow et al 2004). This social use of the communication process is allied to the sense of communication itself being a social process.

> *"As construction may be considered a social process, and considering the complex and transient nature of the construction 'organisation', the need for a good working relationship is paramount."* (Hill 1995 p236)

Furthermore, this interaction, and this relationship must be seen as an important element of the transmission of message and clarification of understanding.

> *"In the observations we noted a high reliance on interpersonal communication to help clarify issues"* (Emmitt and Gorse 2003:122)

The appropriation of the available computer mediated communications can be seen as both to transmit large quantities of information over long distances, but also to establish and reinforce social relationships between participants. This in turn can be

seen as reinforcing the ability to create common meaning and understanding from the message.

METHODOLOGY

The collection of empirical evidence for this paper was undertaken through participant observation. (Deacon et al 1999, Cameron 2001, Gill and Adams 2002, Saville – Troike 1997) Essentially, the author spent a full week, together with several full days prior to, and subsequent to the week, within the host organisation. Although involved in some of the less demanding activities of the organisation, the main purpose was observation. This was overt, with the full knowledge and compliance of the other participants. This can be termed ethnographic research.

> *"Ethnography aims to describe the social experience of the group being studied from the participants' viewpoint. The researcher is usually described as a participant observer, their presence makes them part of the process (Jankowicz 2005). The study attempts to provide an account of what the participants notice as meaningful actions, events and statements."* (Emmitt and Gorse 2007 p 91)

Collection of evidence for this particular event was done as follows: a notepad was used to record the event contemporaneously. The actual conversation which forms the basis of the evidence lasted forty eight minutes. The author was unable to record what was happening at the other end of the conversation due to the physical and temporal restrictions. (Deacon et al 1999, Gill and Adams 2002) The author was the only other person in the room during the conversation, and there were no obvious distractions from the recording process.

After this conversation had taken place, within a matter of minutes, the author was able to interview the main participant in depth, including confirmation of the accuracy, or indeed amendment of the notes taken during the conversation. This interview was fully recorded with the participants' knowledge. This interview allowed a fuller meaning and purpose of the interaction to be confirmed. (Deacon et al 1999, Cameron 2001, Gill and Adams 2002)

THE EVENT

The event concerns the activities of a small shop fitting organisation dealing with a subcontractor who will be carrying out work on a future project. The project is worth approximately £30,000 which is typical for both the shopfitter and the subcontractor. The package of work for the subcontractor includes stripping and redecorating the whole shop, moving fixtures and fittings, with the replacement of certain items. The shopfitter is also employing other subcontractors on this project including a specialist electrician, to handle, amongst other things, the alarms and internet connections from the shop to head office. The shopfitter will also employ a carpet fitter and floorlaying subcontractor.

All the subcontractors are part of an approved list known to both the shopfitter and the client. All the subcontractors are used to this kind of work, which involve working at night, working in city or town centre locations, enabling the shop to remain open, and generally keeping disruption to a minimum. The value of the project, and the location make a visit by the subcontractor to the site unnecessary or unfeasible. The subcontractors' price for the project is based on agreed rates.

The shopfitter has however conducted a full survey of the project, and has the following information: a scheme drawing from the client detailing finishes, positions of fixtures and fittings; a specification for such items as paint, paper, electrical goods; a large number of photographs of each and every internal elevation, ceiling, floor, door opening, and relevant fixture and fitting.

These media have been communicated to the subcontractor via emails with attachments of photograph files; emails with specification attachments; and via the post. The subsequent telephone conversation took place between the shopfitter and the subcontractor. The conversation essentially involved two people using a telephone, together with access to their individual computers, agreeing on the work that needed doing. Both parties to the conversation had the computer file of photographs, both had copies of the specification and drawings.

This use of the different forms of multimedia communication simultaneously is the central feature of this study. The conversation followed the stages of the project step by step, with simultaneous reference to the same photograph, the same section of the specification and the same drawing. Typical extract from the conversation

> *''Can you see that…?''*

> *''Yes there just above the radiator….''*

> *''Yes, you can see it more clearly on the next….yes on 23 [number of photograph]….yes, it's like that one we did at Nantwich……[referring to a similar job for the same client]''.*

> *''So, if we can just approach it in the same……yes that's right, yes that's it, we took the frame back slightly……….yes just so the reveal didn't look wrong''*

From this reporting of the conversation it is possible to envisage how agreement on what course of action to be followed. The anticipation of problems, and means to address them is given by this (one sided report of the) interaction. Written confirmation of specific details on the project was enabled through emails.

> *''We use emails to give us a data trail, so we can all see what has been agreed and when''*

Further extract from the conversation:

> *''What time do you pick her up…?''.*

> *''Is she settling in all right….?''*

> *''She's grown up a lot since I last saw her…..''*

This part of the conversation concerned the daughter of the subcontractor, and personal enquiries from the shopfitter about her. The order, and overall length, of the conversation was such that interjections such as this happened throughout. Matters of business were interspersed with personal issues. This extract is equally important as will be shown in the analysis.

Subsequent interviews with the participant gained a much better insight into the interaction, which was also supported by interviews with other members of staff at the shopfitters, and other subcontract staff. Further similar conversations were also witnessed and recorded.

ANALYSIS

From the above case extracts it is possible to gain the following insights into the interactions between the shopfitter and the subcontractor. The primary means of analysis for this particular event was Hymes's SPEAKING acronym reported in Cameron (2001).

Table 1 shows the explanation of the acronym given by Cameron (2001) in column one and two, with the application of the acronym to this event in the third column.

Table 1

	Hymes Acronym, as described in Cameron D (2001)	Findings from this research analysed using the Hymes Acronym
S	setting: where the speech event is located in time and space	The shopfitter is located in his office in Chesterfield, the subcontractor is located in his home in Stoke.
P	participants: who takes part in the speech event, and in what role (e.g. speaker, addressee, audience, eavesdropper)	Two participants: the shopfitter who is acting as the main contractor; and the painting subcontractor
E	ends: what the purpose of the speech event is, and what its outcome is meant to be	To achieve clarity of purpose in the planning for, and subsequent carrying out of a shopfitting contract.
A	act sequence: what speech acts make up the speech event, and what order they are performed in	Speech acts are ordered using the telephone, with interruptions for questions confirmations or denials. The whole speech act is augmented by the messages provided in the other forms of media.
K	key: the tone or manner of performance (serious or joking, sincere or ironic, etc.)	Much of the speech act is drawing attention to the messages in the other media: the drawings, specifications, photographs and so on; however, joking occurs frequently to interrupt this flow.
I	instrumentalities: what channel or medium of communication is used (e.g. speaking, signing, writing, drumming, whistling) and what language/variety is selected from the participants' repertoire	The main analysis concerns a telephone conversation, so telephones are of course essential. The other media referred to is transmitted by a variety of means: photographs via email and computer, drawing and specification via the post
N	norms of interaction: what rules are for producing and interpreting speech acts	Considerable familiarity is noticeable between the participants; personal details of each others' lives are used to reinforce the personal nature of the relationship.
G	genres: what 'type' does a speech event belong to, and what other pre-existing conventional forms of speech are drawn on or 'cited' in producing appropriate contributions to talk (e.g. do people quote from mythology or poetry or scripture?)	Much of the technical information is spoken about using technical language, however this was not obscure, and 'plain terms' were abundant. The levity in the conversation permitted the use of 'offensive comments'.

From this analysis it is possible to summarise the following points. This analysis is far from exhaustive and further analysis of this event and others will be carried out.

Firstly, the use of multiple media communication devices: digital photographs, computers, telephones, together with drawings and specifications, allowed both parties to gain equivalent knowledge of a particular project. This happened without either being at the site of the project whilst the interaction took place. Also, the participants did not have to meet face to face in the same room. The interaction involved detailed analysis and forecasting of elements of the project, possible problems and means to overcome them. The technical affordances of the available computer mediated communication had been appropriated by the participants to meet their common purpose. The 'process' understanding of communication had been achieved through the transmission of a considerable amount of information in a variety of formats:

drawings, specifications, and photographs. The conversation allowed a fuller interpretation of what each of the participants understood from the media. The shared understanding, or 'meaning' was created through the social act of conversation. This 'social act' understanding of communication was augmented by the explicit use of the conversation to establish and reinforce the interpersonal relationship of the participants. (Sward 2006)

The preparation of the subcontractor after this interaction was far greater than before. However, it should be noted that the physical descriptions of the project: the photographs the drawings and the specification was exactly the same. The greater knowledge and understanding of the project, the preparation, was afforded by the detailed and lengthy conversation, the interaction between the two parties.

It is important to note that both parties were content to take this amount of time to discuss the project. For the subcontractor this was effectively a 'day off' with no income.

Secondly, the conversation was interspersed with personal comments, enquiries and 'friendly banter'. On occasion this was (to the observer) quite offensive, on other occasions very open. The importance of this is that both parties understood that the importance of their relationship was not purely work related. The social relationship of the participants is also important. This can be maintained through telephone conversations, when face to face meetings are less frequent. This reflects Thurlow et al's (2004) observations of the use of CMC to support and reinforce social networks. The advantage of this, in communication terms, is that there is a far greater chance that the shared meaning and shared understanding of the business requirements of the conversation will be met if that shared understanding and shared meaning extends into the social connection. The small talk of the conversation is not simply a 'break from business' it is a reconfirmation that there exists a relationship between the participants which is used to enhance the communication. This reflects the understanding of communication as a 'social act'. (Sward 2006)

CONCLUSIONS

Many new communications devices have been adopted for use in the construction industry. The ability of relatively small enterprises as reported in this case, to take advantage of the technology is related to the price and availability. The insight to be gained from this case is the use of computer mediated technology not simply to process information for construction projects, but to develop shared understandings through social interaction.

The ease with which a quantity of information in a number of formats may be transmitted is obviously important. That this can be achieved easily, cheaply, and not dependent on the receiver being available at a particular point or time is a feature of computer mediated communication. Concerns over technical compatibility were not raised. This follows a pattern of CMC appropriation across many areas. The augmenting of this interaction with the reinforcement of social relationships has also been seen in many other contexts.

Importantly for this study, the illustration shows how the process view of communication, the transmission of information, is woven in to the view of communication as a social act, wherein the participants 'banter' with one another to reinforce their relationship. The two views not only can be seen as occurring simultaneously, but indeed have to occur simultaneously. The effectiveness of the

information transfer is dependent on the shared perspectives of the participants, and this is established through social interaction. The social interaction is given opportunity to take place through the vehicle of information transfer.

REFERENCES

Antoniadis D N, Edum-Fotwe F T, and Thorpe, A (2006) Project Reporting and Complexity *In:* Boyd D (Ed) *Procs 22nd Annual ARCOM Conference*, 4- 6 September 2006, Birmingham, UK, Association of Researchers in Construction Management, 123-133

Barnes S (2003) *Computer Mediated Communication*, Allyn and Bacon, Boston

Cameron D (2001) *Working with Spoken Discourse* Sage, London

Dainty A, Moore D and Murray M. (2006) *Communication in Construction* Taylor and Francis, London

Deacon D, Pickering M, Golding P and Murdock G, (1999) *Researching Communications; A Practical Guide to Methods in Media and Cultural Analysis* Hodder Arnold, London.

Emmitt S and Gorse C (2003) *Construction Communication* Blackwell, Oxford

Emmitt S and Gorse C (2007) *Communication in Construction Teams* Taylor and Francis, London.

Faisol, N, Dainty A R J, and Price A D F (2006) Perceptions of Construction Organisations on Developing Successful Inter-organisational Relationships. *In:* Boyd D (Ed) *Procs 22nd Annual ARCOM Conference*, 4- 6 September 2006, Birmingham, UK, Association of Researchers in Construction Management, 471-479

Fiske J, (1990) *Introduction to Communication Studies*, Routledge, London

Gill D, and Adams, B, (2002) *ABC of Communication Studies Nelson*, Cheltenham

Hill C J (1995) Communication on Construction Sites in *Proceedings of ARCOM*, 18-20 September 1995, University of York **1**; 232-240

Saville- Troike M, (1997) in Coupland N and Jaworski A (1997) *Sociolinguistics a Reader and Coursebook*, Palgrave, Basingstoke

Sward A (2006) Relations as a key resource in Boyd D (Ed) *Procs 22nd Annual ARCOM Conference*, 4- 6 September 2006, Birmingham, UK, Association of Researchers in Construction Management, 405-414

Thurlow C (2002) Generation Txt? The sociolinguistics of young people's text-messaging http://extra.shu.ac.uk/daol/articles/v1/n1/a3/thurlow2002003-paper.html

Thurlow C, Lengel L, Tomic A, (2004) *Computer Mediated Communication*, Sage, London

Winch G, (2002) *Managing Construction Projects* Blackwell, Oxford.