



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Research Commons

<http://researchcommons.waikato.ac.nz/>

Research Commons at the University of Waikato

Copyright Statement:

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

The thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author's right to be identified as the author of the thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from the thesis.

**Asynchronous Communication Technology:
An Organisational Perspective on Efficacy and Use**

**A Thesis
Submitted in Partial Fulfilment
of
the degree
of
Doctor of Philosophy
At the
University of Waikato
by**

Robert James Wellington

**University of Waikato
2003**

Abstract

This thesis begins with a statement that the literature has suggested great promise for Asynchronous Communication Technologies (ACT's) such as electronic mail and related technologies. An ideology of democracy is made explicit in this research in both its content and research process. The research participants were overtly and covertly encouraged to direct the process and topic of the research to enable theory grounded in practice to emerge. A Participatory Action Research (PAR) method was employed that bordered on ethnography and that incorporated an interpretive philosophy. Informed by educational PAR studies, this thesis is written in the first person to represent the learning and the interpretations of the author.

The suggested measures of the quality of this work are that it improves the process of practice, communicates the improvements of practice for continuance and further reflection by other practitioners, and that it helps to develop the theory of Asynchronous Communication Technology use.

This research found that email was used for many purposes and was seen as a very effective form of communication. Email occupied such a variety of uses that explanations were sought that could explain the ability of individuals to comprehend unwritten intentions and behaviours. It was found that email occupied many media spaces, and these can be thought of as media genre. Rather than fundamentally change the way we interact, as was first thought on the initiation of this research project, email

and other ACT's may simply be more convenient, faster, and more efficient than other forms of communication that the research participants had access to. The technological tools that were employed may have had the potential for changing social dynamics over a long period of time, but these tools were shown to be undemocratic in their construction, therefore suggesting that a democratic end may not be in sight for business related ACT's.

Specifically, email did not change the decision making behaviour of the participants, except to allow more freedom and access to information from other staff at the initial stages of the decision making process and to allow for mediation at the end to gain decision acceptance.

Acknowledgments

I started this PhD as a full time student and I wish to acknowledge the unconditional support I received from my supervisors in these early formative and difficult years, Dr John Buchanan, Dr Jim Corner, and Dr Eric Deakins. Thanks also go to my fellow PhD candidate, Dr Nereu Kock, with whom I shared many conversations and collaborations in teaching and research.

The difficulty in obtaining a research client was mainly due to my inexperience but exacerbated by my open agenda. For letting me loose at Carter Holt Harvey (CHH), despite the looseness of the approach, I wish to thank John Tucker, who was instrumental in inducting me into the organisation but moved on before I could thank him fully. For everyone else at CHH that by necessity will remain nameless, who put up with me over the course of my two years in the field at various facilities, I thank whole heartedly.

Just as I was in full swing I fell into a proper family life, quite by accident, but something that I am eternally joyful of. I wish to thank my partner Melissa Davies for putting up with my habit of disappearing whenever I could to conduct interviews, analyse data, or write and rewrite. The fact that I; moved house eight times, gained full employment then changed jobs, lived in three regions, travelling 250km a day for six months, while together we; bought one house and renovated it, and brought up a daughter, in the time I was completing my thesis part time, only begins to suggest how much Melissa has endured to help me in my endeavour. For her continued support and

love I thank her and Abby for being in my life.

To the AUT team in the School of Information Technology I must acknowledge the encouragement and support of Tony Clear who has given me articles that I had not seen, and feedback on ideas I had not been able to share with others. The AUT establishment has allowed me the time I have needed to finish this project and I acknowledge the commitment they have toward research and scholarly activity.

I also wish to thank my dad, the greatest empirical researcher that woodworking has ever seen. And my mum for being the one member of our family without her head in the clouds.

Table of Contents

1	The Nature of This Thesis	1
1.1	The Type of Work that this is	1
1.2	What Did I Want to Study	3
1.3	Why This Type of Work is Necessary	3
1.4	Suggested Measures of Quality for this Work	8
2	Introduction to the Research	15
2.1	The Researcher	15
2.2	The Research Client	22
2.3	Definitions	26
2.3.1	Asynchronous Communication Technology	26
2.3.2	Action Research (AR) Spiral	27
2.3.3	Grounded Theory	28
2.4	The Research Topic	29
2.4.1	Background	30
2.5	Research Objectives	40
2.5.1	Research Objective 1 - new theory	40
2.5.2	Research Objective 2 - existing theory	40
2.5.3	Research Objective 3 - reflection of method & repeatability	41
2.5.4	Research Question	41
2.6	Research Method	42
2.6.1	Preparation	43
2.6.2	Multiple Action Research Cycles	44
2.6.3	Intended Output From Each Cycle	44
2.6.4	Organisation Selection	46
2.6.5	Data Collection	48
2.7	Limitations of Scope and Key Assumptions	49
2.8	Conclusions	50
2.9	Outline of the Report	51
3	Prior Work	53

3.1	Introduction to Prior Work	53
3.2	Precedents (Preparation)	57
3.2.1	Written Language and the Nature of Literate Users	59
3.2.2	Acts of Communication in Email Emergence	63
3.3	Empirical Research (Action)	65
3.3.1	Email Characteristics	66
3.3.2	Choice Between Communication Channels	71
3.4	Conceptual (Reflection)	71
3.4.1	Media Genre and Genre Repertoire	73
3.4.2	Diffusion of Communication Technologies	74
3.4.3	Communication Technology Theory	75
3.4.4	Adaptive Structuration Theory (AST)	76
3.4.5	Communication and Decision Making in Organisations ...	77
3.4.6	Communication and Social Construction	80
3.4.7	Social Order Affects of Communication Technology	84
3.4.8	Politics	91
3.4.9	Techno culture, anarchy, and subversiveness.	91
3.4.10	Action Research	92
3.5	Integration (Learning)	93
3.6	Conclusion	95
4	Research Method	97
4.1	Introduction to the Research Method	97
4.2	Prior Knowledge	100
4.3	Initial Exposure to Action Research	101
4.4	ICIS and Ernst and Young Doctoral Consortium	104
4.5	Supervision	105
4.5.1	Survey - Hypothesis testing	105
4.5.2	Field Experiment	106
4.5.3	Comparative Case Studies	107
4.5.4	Action Research	107
4.6	My Rules of Engagement	112
4.6.1	The Stages That Evolved in This Research.	114

4.7	The Suggested Measures of Quality for this Work	118
4.8	Methodology Planning and Use - Conclusion	121

5 Organisational and Personal Outcomes

	.....	123
5.1	Introduction	123
	5.1.1 Overview of the Research	124
5.2	Preparation	129
5.3	Prior Cycle - Academic	131
5.4	Management Cycle - Initial Negotiations	133
	5.4.1 Teething Troubles	135
	5.4.2 Project Contexts	
	.....	137
	5.4.3 Acceptance - A Green Flag	
	.....	139
	5.4.4 Connections	
	.....	142
5.5	NPD - Starting the Project	146
	5.5.1 Geographically Distributed Process	147
	5.5.2 Improving Data Collection and Communication	149
	5.5.3 Distance is Important	153
5.6	Needed Intervention	154
	5.6.1 The Tool Room as an Island	155
	5.6.2 Technical Problems	159
	5.6.3 Email Tutorials	162
	5.6.4 Data Flow Diagrams	
	.....	163
	5.6.5 The Duality of Purpose - Continued Supervision	
	.....	165
	5.6.6 Continuation of Technical Intervention	
	.....	173
	5.6.7 Full Steam Ahead	175
	5.6.8 Intensive Research	176
	5.6.9 Positive Progress	179
	5.6.10 Reflection on the NPD Project	180
	5.6.11 SMU Cycle Shelved	180
5.7	Conclusion of Organisational Change	182

5.7.1	Prior Cycle - Academic	182
5.7.2	Management	183
5.7.3	NPD	183
5.7.4	Training	184
5.8	A Reflection on the Measures of Quality	185
5.8.1	In the conclusion of this work is it evident that I was able to improve the practice of Action Research and improve the practice of Information Systems management and development?	185
5.8.2	Can this work be carried farther?	189
5.8.3	Have I been able to incorporate prior research while not prejudicing the theory development and knowledge explication from the field?	190
6	Data Analysis	191
6.1	Rigour	192
6.2	Statistical Clues - Data Mining	196
6.3	Hermeneutic Analysis	202
6.4	Summary of and Limitations of Data Analysis	205
6.4.1	Member Checks	207
7	Results	211
7.1	Defining the Results In Relation To Email	214
7.2	Comparing Interview Process - Ethnographic Rigour	217
7.3	Summary Table	228
7.3.1	Quick Summary Results Table	229
7.4	Technological Democracy	240
7.4.1	Legitimacy	246
7.4.2	Communication Overheads	249
7.4.3	Distance and the Distributed Business Environment	251
7.4.4	Decision Making	254
7.4.5	Asynchronous	256
7.4.6	Attachments	259
7.4.7	Control, Responsibility, and Confrontation	259
7.4.8	Autonomy	261

7.4.9	Visibility and Accessibility	262
7.4.10	System Development Processes and Communication	263
7.5	Media Genre	264
7.5.1	ACT's as an Efficient Infrastructure	265
7.5.2	Media Richness and Variable Social Presence	268
7.5.3	Adoption	268
7.5.4	Compatibility and Change	270
7.5.5	Document Handling	271
7.5.6	Recorded Communication	271
7.6	Summary of Results	272
8	Conclusion	275
8.1	Summary of the Project	275
8.2	Results	276
8.3	Organisational Interaction and Action Research	277
8.4	Conclusion of the Success of the Research	280
8.4.1	Research Objective 1 - new theory	280
8.4.2	Research Objective 2 - existing theory	281
8.4.3	Research Objective 3 - reflection of method & repeatability	282
8.4.4	Research Question	283
9	Discussion and Future Research	285
9.1	Technological Democracy	286
9.1.1	Signification, Legitimation, and Domination	288
9.2	Media Richness, and Genre	289
9.3	Future Research	295
9.3.1	Technological Democracy	295
9.3.2	Media Genre	296
9.3.3	Other Future Directions	303

Appendix 1	.....	305
References	.....	345

List of Figures

Figure 1 - The Negotiation Process in Kock, Corner, and McQueen [1997]	19
Figure 2 - A Modified Process for Topic Negotiation with Management, the coopted User Group, and Emergent Participants	20
Figure 3 - The Action Research Cycles in this Project	27
Figure 4 - Organisation of Research Project based on Traditional Hierarchy (adapted from [Stringer, 1996: 131] - figure 7.1)	45
Figure 5 - A Community Oriented Structure (adapted for [Stringer, 1996:133] figure 7.3)	46
Figure 6 - A recursive model of network involvement and media Use in organisations [Contractor and Eisenberg, 1991]	75
Figure 7 - The Expected Process Model for the PAR Research to be undertaken	113
Figure 8 - The Research Cycles in detail	126
Figure 9 - A comparison between interview interactions {ethnographic style Vs semi structured interview style}	219

List of Tables

Table 1 - Democratic Design Criteria [from Figure 5-1 in Sclove, 1995a:98]	5
Table 2 [from a description in Marchand, 1989: 157]	89
Table 3 - An attempt to describe the difference between normal descriptions of AR in education and IS research as a synthesis of the discussion on ARLIST - Spring 1998	108
Table 4 - Types of AR [Zuber-Skerrit, 1992: 12]	110
Table 5 - Major, Minor, and AR events in the Research Project	128
Table 6 - Classification of Words as Active, Passive, or Grouped.	199
Table 7 - Distinction between methodology and methods of the research.	204
Table 8 - The Major Research Cycles and Outputs	213
Table 9 - Coincidence of Occurrence of Communicate and Email	215
Table 10 - Coincidence of Occurrence of Word Group Scales	216
Table 11 - Word Counts of Transcribed Interviews	227
Table 12 Summary of concepts derived from grounded theory generation.	229
Table 13 - Democracy of Technology Criteria [Sclove, 1995:98] analysis	241

1 The Nature of This Thesis

The Great Society created by steam and electricity may be a society, but it is no community. .. Till the Great Society is converted into a Great Community, the Public will remain in eclipse. Communication can alone create a great community.

[(Dewey, 1927:98,142) quoted from Rogers, 1994:163]

1.1 The Type of Work that this is

When I started this research into Asynchronous Communication Technologies (ACT's) such as email, and discussion list servers, aside from the rhetoric that communication is the most important part of our organisational and societal lives, I was stimulated by two major factors. The first factor was the increase in the use of the Internet and forms of electronic communication such as electronic mail (email). The second factor was the

internal debate within the Information Systems (IS) field on what should be researched and how this should be accomplished. Specifically, Lea [1991] suggested that the predominant laboratory-reductionist type of research into email was unable to adequately explain the rich context of its use and would prove deficient at explanations of use.

This research was conducted mainly within one company, over an extended period, and I interacted with many members of that company in a variety of capacities, including: researcher, trainer, expert on email (relative expert at least), expert on information systems (again, relative), and in an informal consultative role. What I wanted to study was the technology in a holistic sense, rather than a “*deterministic*” sense [Staudenmaier: 1994:263], to investigate the gross effects on society. One of the earliest works that I read started this train of thought, where Boshier [1990: 51] claimed that

E-mail appears to provide a context for the kind of non-coercive and anti-hierarchical dialogue that Habermas (1987) claimed constitutes an ‘ideal speech situation’, free of internal or external coercion, and characterized by equality of opportunity and reciprocity in roles assumed by participants.

The concept of a more democratic or less coercive medium has been prominent in the literature and will be discussed later. Other motivations will be cited in the body of this work; however, at the very least I must phrase my work at the outset as it should be

regarded as an interpretive work and cannot be read with traditional positivist presuppositions or measures of quality. A brief description of what is included in this report along with suggestions for assessing the quality of the work follow a brief summation of the topic of this thesis.

1.2 What Did I Want to Study

Computer based tools for personal productivity, group facilitation, and distributed discussion were all diffusing into society at an accelerated pace in the latter half of the nineties, and I believed that holistic research into these types of communication technologies was incomplete. There had been many experimental studies into the micro effects of technologies such as email and Group Decision Support Systems (GDSS), but these were conducted mainly with student populations or in controlled settings that I believed did not give a complete picture of what email might be used or useful for. I attempted to place emerging computer mediated communication at the forefront of a study into organisational communication to explore the actual use of the technologies.

1.3 Why This Type of Work is Necessary

The need for work in this area has been best explained, in a complete argument, by Richard Sclove within a chapter of the book *Resisting Virtual Life: The Culture and Politics of Information* [1995a] where Sclove argues that *strong democracy* needs to be

designed into technological clusters within our community and working lives¹. The somewhat tautological but persuasive argument starts from the premise that technologies have focal and non-focal impacts on social and political structures in communities², a not too dissimilar argument to McLuhan's concept of 'reversal' [1989]. Reversal is a widely available theme, Sproull and Keisler [1991] describe a similar concept, *second order* effects, while Kaufer and Carley [1996] describe it as an *evolved* effect. Sclove explains this as;

Technologies don't merely deliver sundry consumer benefits (not to mention sundry hazards and irritations); they constitute part of a society's core political infrastructure. Technologies do this by establishing an intricate and pervasive network of structurally consequential social influences, opportunities, constraints, and inducements. [Sclove, 1995a:88]

Specifically, Sclove points to a specific problem that technological democratisation could solve, that of "*the decline of face-to-face community and the degraded nature of work,*" an important aspect in consideration of the topic of this thesis. The Prior Work section will outline the empirical literature that suggests that ACT's have a

¹For a more recent account of democracy and technology that is situated in IS and supports Scloves' basic tenets see Berg [1998].

²The example that Sclove uses is of the introduction of household water supply in Ibieca, in Spain in the 1970's, and the subsequent disintegration of community dialogue, the replacement of donkeys with tractors, and the perpetuated need for outside employment to buy these tractors and other appliances such as washing machines.

democratising effect with regard to status effect minimisation and reduction of social cues. Although this may only be a synthetic solution to the decline of actual face to face community.

Sclove does not leave us in a critical stasis, as he proposes a provisional set of design criteria for democratic technologies described in Table 1. It should be noted that Sclove suggests that we cannot treat technologies as separate but must analyse them and treat them in clusters. From this perspective it is paramount that we understand technologies from a social context perspective because ‘a’ technology is not in existence by itself, but part of an interacting cluster within a social use context. Or, as supported by Rob Kling, technological artifacts are not “*discrete entities*” but so closely related to the organisational setting that it makes no sense to pry them apart [Kling, 1991]. Berg [1998:465] also persuades us to study the “*web of computing: or the ensemble of artifacts, skills, applications, and infrastructure that constitute the technical systems whose functions are not predetermined but only evolve within specific sociopolitical contexts*”.

Table 1 - Democratic Design Criteria [from Figure 5-1 in Sclove, 1995a:98];

Design Criteria	Description of Criteria
Toward democratic community	Seek balance between communitarian/cooperative, individualised, and intercommunity technologies. Avoid technologies that establish authoritarian social relationships.
Toward democratic work	Seek a diverse array of flexibly schedulable, self-actualizing technological practices. Avoid meaningless, debilitating, or otherwise autonomy-impairing technological practices.

Toward democratic politics	Seek technologies that can help enable disadvantaged individuals and groups to participate fully in social and political life. Avoid technologies that support illegitimately hierarchical power relations between groups, organizations, or polities.
To help secure democratic self governance	Restrict the distribution of potentially adverse consequences (eg., environmental or social harms) to within the boundaries of local political jurisdictions. Seek relative local economic self-reliance. Avoid technologies that promote dependency and loss of local autonomy. Seek technologies (including an architecture of public space) compatible with globally aware, egalitarian political decentralization and federation.
To help perpetuate democratic social structures	Seek ecological sustainability. Avoid technologies that are ecologically destructive of human health, survival, and the perpetuation of democratic institutions. Seek local technological flexibility and global technological pluralism.

Sclove points us in a direction of being able to measure the benefit of a technology, and this direction is supported in the IS field by Berg [1998]. Explicitly incorporating the democratisation of technology at the outset is a philosophic position that results in an adoption of a value laden approach. Participatory Action Research will be shown to satisfy the needs of the democratisation of technology in both its ability to allow for the researchers reflection of values in the approach, and because AR, as a research technology in community based projects, has many features required by a democratic technology [Stringer, 1996:9] [Hall, 1996:29]. Unfortunately, to this very day of writing

Action Research and the Participatory variety in particular are not widely used³ or unilaterally accepted in the field of IS although they have genuine merit and pragmatism [Kock & Lau, 2001][Lau, 1997]. Kock and Lau edited a special issue on Action Research in the Journal of Information Technology and People and as such have undertaken significant research, and experienced the extent of AR in the IS field. Their suggestion is that Action Researchers are *masochists*, in that they have to . . .

work harder, deal with more “real world” problems, and face more difficulties getting their work published than their colleagues who do experimental, survey and case research [Kock & Lau, 2001].

The dual nature of the conflict that arose, putting to paper an interpretive philosophy and a participatory research method, given the debates that have occurred in the field of IS previously, was difficult. Action Research has not been undermined as a valid research approach explicitly, but it has been undermined implicitly in the form of classification⁴ of utility from the perspective of the dominant paradigm. In a widely cited classification of AR [Susman & Evered, 1978], AR is compared against positivist science criteria and found to be incomparable, and the subsequent discussion as to whether this is true

³Lau [1997] surveyed the literature of the past 25 years and found 600 articles related to IS keywords, of which, only 70 reported to have used AR in; business, health, education, and social science.

⁴Galliers [1991] describes a number of previously published taxonomies of IS research approaches, of which only his own has AR as a separate approach. The other authors cited have either; included AR in Case research or in Field experiments, or have not determined it is an approach used in IS research.

[Kock, McQueen, & Scott, 1997] colonises the discussion of comparison with positivist terms. Regardless of the outcome, the debate over whether AR is justifiable in terms of positivism is formative, as Deetz [1996:204] persuades us that the classification from a dominant paradigm can be an injustice. Furthermore, Berger and Luckman [1966: 110] contend that the naming convention brings incipient legitimacy, meaning that the colonisation of the AR debate by dominant positivist researchers will legitimise a certain way of undertaking AR, or interpreting AR. It is only at this very moment that I am given some assistance in the arduous work of substantiating the method and philosophy of this research. Kock & Lau [2001] recent article on AR provides some evidence of successful AR IS work and there has been some broader epistemological debate in the IS literature recently that supports the interpretive style of this work and the methods used. However, because this work deviates from the traditional, the immediate question that needs to be addressed is, how can the reader measure the quality of this work? The following section suggests some measures of quality for the research I undertook.

1.4 Suggested Measures of Quality for this Work

When I first started my PhD I was not envisaging producing a work that was too far removed from acceptability of mainstream IS literary publications, having selected an Action Research method that was pragmatically appropriate for understanding change in an organisation and which was being used by a fellow doctoral candidate in the department. Since then the IS research community has moved sufficiently toward

accepting 'intensive' research, and interpretive research specifically, that this work has deviated in parallel with this movement toward a participatory method that is more prominent in education research than IS research. It would, therefore, be difficult to measure this work on the criteria that might have been used to judge its academic merits at its inception except in the reduced argument of how relevant *what was planned* was a good idea at the time.

My initial movement toward the rare end of the philosophic spectrum, at least in terms of IS research, was upon reading postmodern perspectives on the history of social science. Convinced that all knowledge construction processes are contested [Seidman, 1994] I gravitated toward a value laden research philosophy and a postmodern perspective to research and reporting research.

The question of the utility of the research has been addressed in IS dialogue under the heading *The Practice of Relevance* with the overt objective of researching topics that IS practitioners deem contemporary. Benbasat and Zmud [1999:4] recently summarised the debate of the last 10 years, with these questions "*Does IS research produce the knowledge that today's IS professionals can apply in their daily work? Does it address the problems or challenges that are of concern to IS professionals? Does it focus on current technological and business issues?*". Benbasat and Zmud's comments presuppose that the way that our society functions is that business organisations take the lead from the academic community, something critiqued at length in a book, *Futile*

Progress [Braun, 1995], and that the agenda of the organisation and the IS professional is the only one that should bear relevance to the topics and palatability of IS research. A dominant paradigm of management or IS professional control of systems is a context where the user group is possessed rather than possessive [Kroker, 1992] and this dominance has not allowed the inclusion of other perspectives of organisations and society. It would be prudent for the IS community to give researchers with a different social or political agenda the opportunity to study IS topics from within the IS field. Widening the question to include a multitude of individuals and agendas may help us understand broader dynamics of the technological creations of social groups⁵.

The movement toward 'alternative' research in IS has culminated in at least one leading IS journal, *MISQ*, compiling a special issue on the subject and with representative research articles using 'intensive' research methods. It is in this mind that I am bent toward using a modern rather than a historic mode for determining the quality of this research report in that Markus and Lee [1999:36] expressed their experience in editing this special edition of *MISQ*;

...we found that some readers inappropriately use positivist criteria to judge interpretivist intensive research, and others inappropriately use interpretivist

⁵For different perspectives look at government responsibility for social utility and equity [Braun, 1995: 205], democracy and technology [Sclove, 1995: 87][Berg, 1998], mass media and automation [McLuhan, 1964: 346], organisational structure [Birchall & Lyons, 1995], or philosophy and the position of the individual [Kroker, 1992: 6].

criteria to judge positivist intensive research. While intensive researchers have been, unfortunately, habituated to the application of inappropriate criteria to intensive research by some colleagues who specialize in quantitative methods (a practice that, fortunately, has been lessening recently), we have been shocked and dismayed by similar lack of “professional courtesy” by intensive research specialists.

The “*poorly formed conflicts and discussions*” that have predominated the emergence of alternative methods has been due to inappropriate categorisation and classification of research approaches [Deetz, 1996:191]. To avoid this erroneous classification and to assist in a better understanding of the research undertaken through, one of a very many variety of approaches available, Markus and Lee continue;

Because the Special Issue is soliciting submissions of exemplars, authors of a submission (1) must identify clearly in their manuscript’s methods section the criteria by which to judge research that employs their particular intensive method and (2) must show explicitly how the research in their manuscript meets those criteria.

Accordingly, I will discuss the following measures of quality in the Methods section as suggested; however, the presentation of them below is delivered to clarify my major evaluative presuppositions at the outset. With regard to Action Research Lau gives us

a starting point to construct these measures of quality with a definition that Lau considers '*one of the most comprehensive*' by Hult and Lennung [1978];

Action research simultaneously assists in practical problem-solving and expands scientific knowledge, as well as enhances the competencies of the respective actors, being performed collaboratively in an immediate situation using data feedback in a cyclical process aiming at an increased understanding of a given social situation, primarily applicable for the understanding of change processes in social systems and undertaken within a mutually acceptable ethical framework.

1. The first measure is central to the Action Research method - Improving the process of practice.

In the conclusion of this work is it evident that I was able to improve the practice of Action Research and improve the practice of Information Systems management and development?

2. My second measure of quality is how well I have communicated the improvements in my practice for continuance and further reflection by other practitioners of Action Research and IS management and development.

Can this work be carried farther?

3. The third, and last, measure of quality is related to the development of the theory of Asynchronous Communication Technology use.

Have I been able to incorporate prior research while not prejudicing the theory development and knowledge explication from the field?

Have I been able to produce an intelligible synthesis from the multiple sources of theory and data to produce a convincing argument of both the known and unknown?

Now that the presuppositions are explained, I can now proceed to the thesis proper. The next section introduces the research topic, the researcher, the client organisation, and the research method. The subsequent chapters provide the necessary detailed accounts of the Prior Work, Research Method, a description of the Organisational and Personal Outcomes, and the subsequent Data Analysis Process, followed by the theory construction or Data Analysis Results, and finishing with a Conclusions, and then Discussion and Future Research chapter.

2 Introduction to the Research

Now, more than ever, there is a need for our businesses to develop new ways of maintaining and improving performance, regardless of the operating environment. That is our Primary objective. To achieve this, we must become the supplier of choice for our customers. This means we must add value to their business with our products, services and responsiveness.

Carter Holt Harvey Annual Report 1997.

In Action Research, the emphasis is more on what practitioners do than on what they say they do [Avison, Lau, Myers, and Nielsen, 1999: 96]

2.1 The Researcher

This thesis represents a reflection on my professional practice as dually a researcher and practitioner. One suggested measure of quality for this thesis has already been established as *Improve the Process of Practice*, and to ascertain how well I achieved that

goal it is important to describe my practice at the inception of the research. Outside University, my most recent business experience centred around the construction industry as a cadet quantity surveyor, or building estimator, but the stock market crash of 1987 and the subsequent lull in new projects forced me to reconsider this line of work. I had previously worked in the banking and manufacturing industries in clerical roles but I did not want to revert to this area, so I enrolled in a bachelor degree. I obtained a bachelor degree with first class honours from Waikato Management School in Hamilton, New Zealand, and immediately enrolled in a PhD.

Although the undergraduate degree had practical content, and I had undertaken a few private consulting projects, I considered my skills in consulting and Action Research to be wholly inadequate and I took whatever steps I could to build my abilities before undertaking the major part of my research. One activity that I involved myself with was an online course AREOL (Action Research and Evaluation On-Line) run by Bob Dick at Southern Cross University⁶. This course ran over several weeks and we as learning peers discussed AR in-depth with many of my peers having consulting and research experience to draw on. I also participated in an action research iteration of a colleague within an education provider organisation [Kock, Jenkins, Wellington, 1998]. This research investigated the critical success factors of Business Process Improvement (BPI) group facilitation through groupware that comprised an electronic mail package, Novell Groupwise™ and a facilitation structure.

⁶ Information on AREOL can be found at <ftp://psy.uq.edu.au/lists/arlist/areol>

The research I undertook with this colleague, Nereu Kock, was formative in my selection of an area to research. I particularly wanted to study the *actual* social use and interpretation of electronic mail; however, the structure that was present within Kock's research also led me to think very carefully about my use of Action Research. I became a discussion list member of an action research group ARLIST and mainly lurked, but occasionally actively participated in the discussion. I became aware of differences between the use of action research in IS that I allied with Kock's work and the use within community based, education, and health research that I was beginning to be exposed to on ARLIST and AREOL. The emancipatory nature and emergent characteristics of action research in these areas became persuasive in my final decision to use the method and to subsume the underlying philosophy inherent in the education research.

I sent out approximately 60 e-mails, 30 letters, and made about 50 telephone calls, trying to identify a research partner for my research project. As a new Action Researcher this experience was an enlightening, and a humbling one, I had to be able to convey the purpose of the research and the benefits to the organisation that would participate. Ultimately, although I had many meaningful conversations and interactions with company executives and PR people my research partner was eventually found through a supervisors industry contact.

I attempted to obliterate the distinction between the academy and practice⁷ in my dealings with the research clients and made careful note of the language that was used in my interactions and tried to mirror that style back to the client. Action Research is well developed as a valid form of enquiry in Education⁸, Health, and Community disciplines. Although Action Research has been used in Information Systems it has not yet reached the same maturity as it has in Education and Health. The method has been used successfully in educational research for many PhD theses to explore the conduct of the professional undertaking and participating in the research. The limited use of AR in IS has not yet reached the mature level of joining the Professional with the Discipline of IS, at least not when I started this research and there is little evidence⁹ to suggest that this has occurred in subsequent PhD or mainstream research. Lau [1997] undertaking a review of 25 years of IS AR research states that of the articles examined “*none of the articles appeared in such mainstream IS journals as the MIS Quarterly, Information Systems Research, Communications of the ACM, or European Journal of IT. Nor were*

⁷Universities have not always been isolated from practice, see Ashton [1968, 15-16] but now suffer from a crisis of legitimacy in the IS field [Benbasat, 1999].

⁸Online theses have been cited from Internet web sites specialising in the dissemination of AR resources; Jack Whitehead's site at Bath University (<http://www.bath.ac.uk/~edsajw/living.shtml>), and Bob Dick's site at Southern Cross University (<http://www.scu.edu.au/schools/gcm/ar/art/arhome.html>). See education PhD theses; Eames [1996], Laidlaw [1997], Evans [1997], Hughes [1996]. See also education Mphil theses; Larter [1988], Holley [1997], Patarroyo [1995]. And also education Masters dissertations; Shobbrook [1997], John [1995], Maguire [1995]. PhD's in other areas; Agriculture extension [Roberts, 1997]. Other reports can be found at ARROW (Action Research Reports on the Web) at the University of Sydney (<http://www.cchs.usyd.edu.au/arrow/links.htm>).

⁹The only IS PhD thesis that I was aware of was by N.Kock [1998] who used a predominantly non-participatory AR.

there any articles in Organization Science and Management Science that are often considered the alternate sources for many of the scholarly IS publications. Only one article was published in the Journal of MIS”.

I will be considering my Professional Practice in two dimensions, my IS Consultative capacity and my Academic/theorising capacity. Kock [1997:4] uses this phrase in a description of Action Research “Although typically applying very little, if any control on the environment being studied, the AR practitioner is expected to apply intervention on this environment.” This perspective highlights the researchers ownership of the intervention, but some attempts to collapse this distinction have since been made, Avison [1997] describes AR as being different from interpretive case studies in that “practioners as well as the researchers participate in the analysis, design, and implementation processes and contribute as much as the researchers in any decision-making.” However; one question remains that was raised in the discussion of the

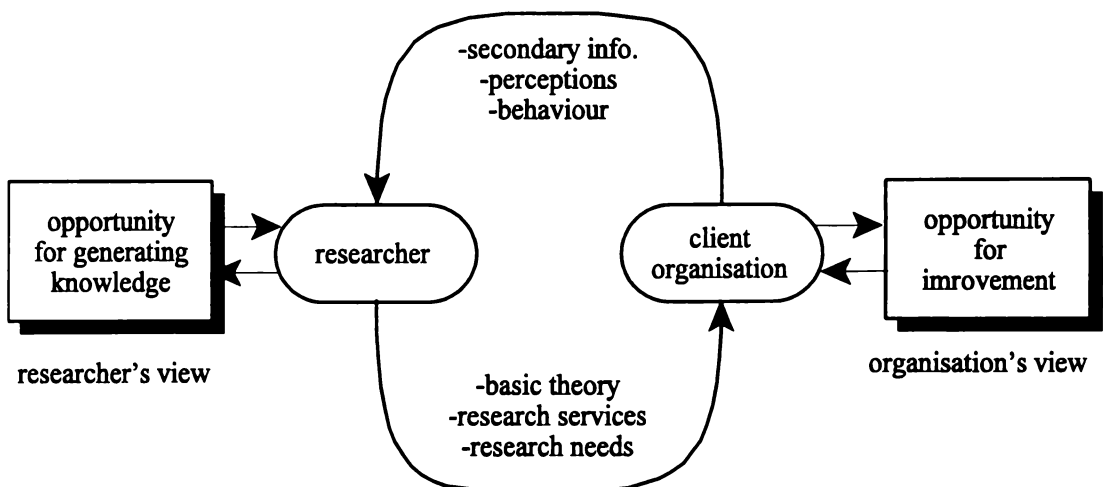


Figure 1 - The Negotiation Process in Kock, Corner, and McQueen [1997]

Practice of Relevance in IS previously and that is whether the participation in an IS AR project involves the IS professional and the Management of the organisation or whether the involvement also includes direction and decision making of the user group and other stakeholders. Unlike the descriptions of IS AR I have not considered it appropriate to maintain the dichotomy between the Researcher and the Practitioner¹⁰ in my intended work, but to repeatedly question this separation by building on organisational other than academic principles of change and understanding, and reflecting on the outcomes. An explanation for the perceived difference between the existing body of IS research and my intended model allied with the education philosophy of AR are described in Figures 1 and 2.

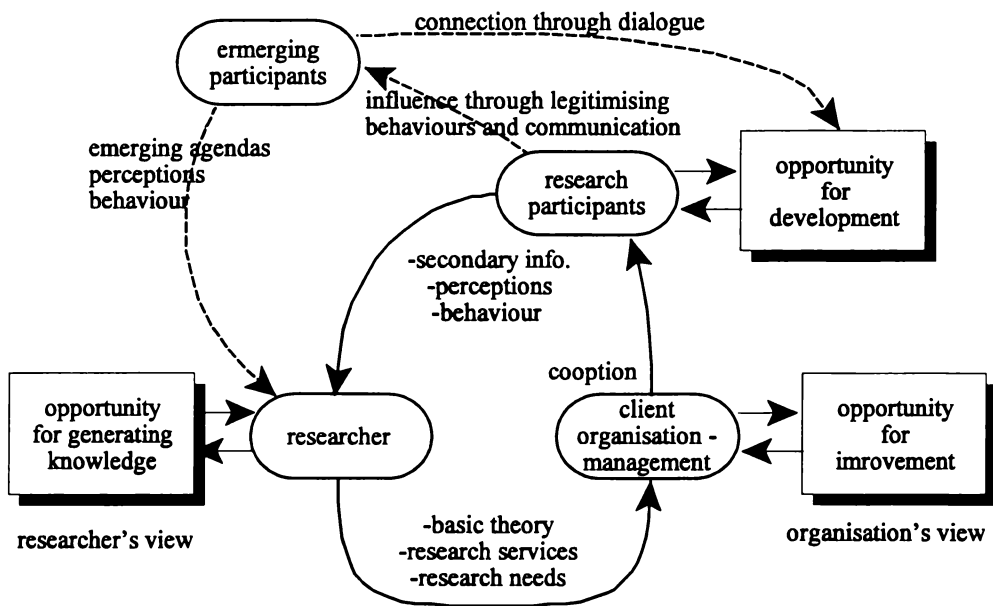


Figure 2 - A Modified Process for Topic Negotiation with Management, the coopted User Group, and Emergent Participants.

¹⁰ As has been suggested for the field of Operations Research [White & Taket, 1994:733].

These models show the level of participation in the method that I was exposed to in my initial research cycle as an apprentice in another colleagues research project {Figure 1}, and the extension I made to include the research participants in the development process {Figure 2}. Differentiating the management and the participants was a useful step to take to understand the social nature of ACT's in general use, and adding an emerging element highlights the control that the participants had in steering the research project. The first research that I was involved with will be discussed at some length later; however, it is important to point out that the topic of this research, although ACT related, was centred around Business Improvement Groups, which are usually a management initiative and therefore suit the non participatory method used in this cycle.

To continue the research on ACT's and to extend the theory to include broader social effects I needed to develop a different style of research and adopt a more holistic philosophy than that which had been used in previous laboratory and field experiments. The style of the research is manifest in my personal claims for this thesis, listed below:

1. By not privileging an academic perspective I developed a consistent understanding of the individual theories used by organisational members to understand email phenomena.
2. I have synthesised a very broad collection of literature about asynchronous computer mediated communication to interpret the results from the research.

3. I imparted research control to the participants overtly and covertly to ensure the contemporaneity of the research content.

There has been a major call to add relevance to research in the IS field, this is my expression of an action I undertook to join the profession of IS with the construction of theory. This expression is quite different from that which is normally described in IS PhD theses, but borrows from the form found in Educational PAR theses.

2.2 The Research Client & the Interaction Approach

This thesis is the description of a journey that started with preparation and then with a 'stepping-out' into organisational life and then ended with a meta-reflection. The organisation that was a partner for the major part of this research became a focus for reflection on an emergent form of social interaction, while the world forged ahead into a variety of directions. The organisation was never closed to the outside world and neither was this researcher, however, this organisation forms a useful 'whole' in the respect of containing a complete social context that is recognisable and comparable. This organisation is one of the major 'threads' of this thesis. This is the first end of that thread, paraphrased from my research diary.

I was accepted into the company to participate in an ongoing initiative so that I could learn about the company and how it used email,

and also so that I could input my knowledge and perspective to assist the company in a positive direction. I suggested specific research outputs at this early stage but the feedback I received was that for the most part I should just start and we would all find out where this led us. The feelings that I had at these meetings was of being relaxed and of communicating with confident, knowledgeable professionals who were willing to learn about an emerging technology. They were results oriented, but they realised that email had potential and threat and they needed to get to grips with how it worked within the organisational system.

....I eventually made a tour of the facility in January 1998. I met with Nick and we made small talk, and then he instructed me about general fire procedures and health and safety issues about walking through the factory. They issued me with earplugs, safety glasses, and a "lovely" elasticated hair restraint. Nick outlined whom I would be meeting with on the tour, including I.T. personnel and the people who were in the NPD area.

During the walk around we went through the offices that had the cafeteria off to one end and the staff common room adjoining it. In the common room there was a board that had the names of long serving staff, and life time members of the social club. Nick proudly pointed out his name along with those that had been at CHH for twenty-five plus years, some 30-

40 names on it. There seemed quite a tradition.

This thesis is the culmination of my research into electronic mail (email), or more generally Asynchronous Communication Technology (ACT), which I began just as email was becoming the norm rather than the exception in New Zealand organisations. Planning and preparation activities started in 1996; however, the research proper started in late 1997 and continued through to the last of the data collection activities in early 2000. The research used a Participatory Action Research (PAR) methodology with a low degree of academic control, allowing the participant organisation a high degree of direction in the research to allow localised knowledge to be brought forward untainted by academic forethought. The main research client for this research, Carter Holt Harvey Plastics (CHHp), had been using email for more than a year on a Windows for Workgroups© system. At the beginning of the research CHHp had recently been connected to the corporate wide Intranet and now had the facility for Internet communication through this system. The new system was an Outlook Windows 95© client with a Microsoft Exchange NT© server.

The level of analysis of the research is developed at the organisational level. The socially constructed use and form of the technology suggested that an interpretive method of analysis was appropriate to further enrich the existing body of experimental work in this area. Further, I was driven to research the e-mail phenomenon because the changes to organisations and society are potentially epochal. Tuman [1996:26] argues that the

decline of print and its replacement by 'online literacy' has epochal significance "*not just a change in communication or technology but a change in civilization itself.*"

The key to the success of this research was to stimulate natural changes that are prevalent in organisations to predict, through rigorous reflection, the social changes that will occur through more intensive and widespread use. Already, business scholars are predicting fundamental structural and social change in organisations and the intention of this research was to develop an understanding of where these changes are leading us in our organisational lives.

I carried out several interventions, which characterise some contemporary use of the email technology in this business enterprise using an Action Research methodology. The interventions were negotiated with organisational members, to provide realistic change, and consisted of the expansion of desired knowledge about ACT and specific technical interventions.

Robustness was enforced through the mode of my consultative participatory enquiry in the research context and the method of data analysis used in this report. The intention was always to create "Grounded Theory" about the actual use and perceptions of email, and more generally ACT. Therefore, strategies were used to allow data that was collected to be as locally truthful as possible. As much as possible I wanted the whole

social context represented in this analysis, rather than *capta*¹¹ particular to an academic viewpoint. Robustness was measured by the successfulness of these strategies in producing independent organisational thought about email and ACT. This independence is analysed in the data analysis section using a qualitative data analysis package originally used for psychoanalysis and specifically useful for determining interviewer influence over the subject.

2.3 Definitions

Some of the major concepts and technologies that are used in this thesis are described below.

2.3.1 Asynchronous Communication Technology

The focus of the research project was on the host of technologies surrounding Electronic Mail (email), such as, discussion list servers, public folders, personal productivity or organisational software, groupware, and file transfer technology. Usually these technologies are bundled together in not too dissimilar packages, in this case Microsoft Outlook™ and Novell GroupWise™ were used in organisations participating in the research. The objective concept of the technology being asynchronous will be discussed in the Prior Work and the Results chapters.

¹¹Data that has been captured by a human because of a particular interest. The term I was first introduced to by Peter Checkland in a presentation at the Information Systems Conference of New Zealand, 1996.

2.3.2 Action Research (AR) Spiral

The research process in an AR project is one of iteration. Some action is undertaken after it has been planned by the participants, and / or the researcher and sponsor. AR projects that have a high degree of participant direction are often called emancipatory as they allow the participants to be critical of unnecessary control structures or systems. Somewhat cynically, AR projects that have no direction from participants are called field experiments, or at least this is the view of researchers in fields such as health, education, and community research.

No matter what variety of AR you are using you will be basing your research on the action learning spiral, which is often characterised, or abbreviated, by the phases of planning, action, reflection, and learning as described in Figure 3. Specifically, Figure 3 describes a collection of spirals that are symbolic of this research project. There are

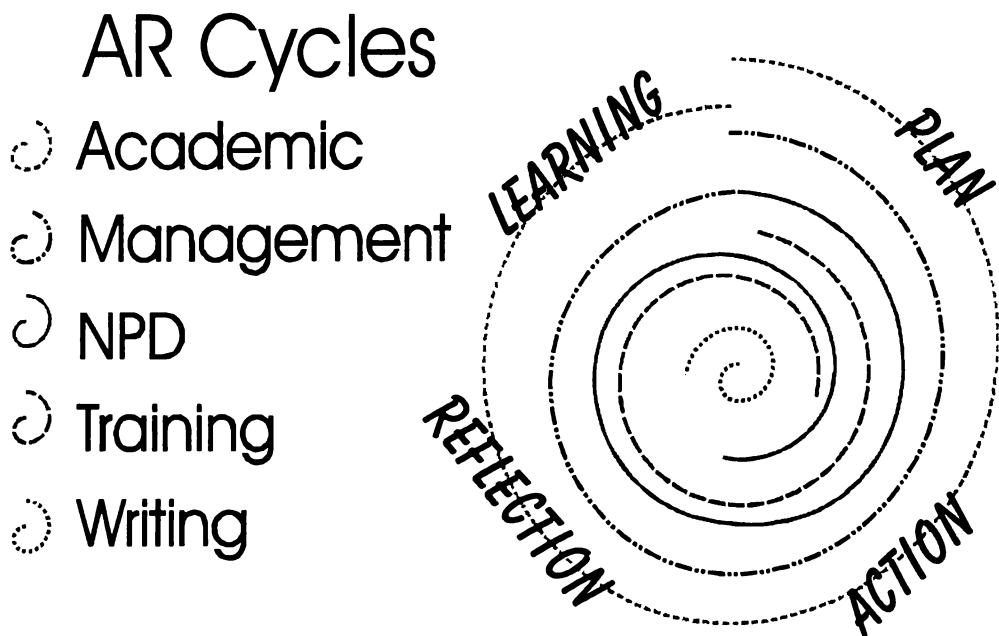


Figure 3 - The Action Research Cycles in this Project

five spirals, each representing a different type of context and change. The first spiral 'Academic' represents my preparatory work and incorporates my collaboration in another project on a similar topic (later referred to as *Prior Cycle*), which led me to this specific topic of enquiry and helped me refine the AR method for this particular project. The first contact that I had with CHHp, the major research client, is represented by the second cycle 'Management'. It is at this stage that the managers at the participating organisation collectively isolated two projects that I could work on: the New Product Development (NPD) process, and the Strategic Marketing Units (SMU) project. I undertook the NPD project, but the SMU project became diffused in the output from the NPD process and various other business initiatives that were being carried out. Alternately, I conducted eight training sessions that I undertook at two facilities at CHHp.

2.3.3 Grounded Theory

The term *Grounded Theory* or the phrase "*Theory Grounded in ...*" is used throughout this work. It is essential that the reader does not relate this phrasing with a singular proprietary method for grounding theory in social contexts. The phrase is used generically for the concept of context emergent theorising that is a characteristic of ethnographic research. The rigour in achieving grounded theory relates to my ability as a researcher to limit the influence of theory on the reflections of the participants. However, from a postmodern perspective this poses a fresh collection of issues. One research participant handed me articles incorporating academic theory, whilst another

requested resources for undertaking Action Research. The influencing 'texts' of the academy are not solely embodied by the researcher; however, this is the only factor that I have to monitor as the remainder of the influences are elements of the *natural* context.

In summary, grounded theory is theory that emerges from the field. From the reflections of the participants when they are able to express themselves without influence from a structure or from predefined concepts that the researcher imposes in the questioning or data collection process. Discussion of hermeneutics and ethnography is undertaken in the Prior Work, Data Analysis, and Results chapters.

2.4 The Research Topic

Hopefully, the preceding text has shed some light on what it is that I actually set out to do, and the flavour of the research output that was forthcoming. Before I continue with a description of what is in this document, it is necessary to fill out the introduction with an expansion of the grounds for the research, starting with the research background. The research objectives that were the basis of my enquiry are described, and an outline of the methodology that was adopted is also presented. Following the outline of the thesis is a discussion of the limitations and assumptions, and the conclusion of this introduction.

2.4.1 Background

2.4.1.1 *Technology and Society*

In the last twenty years, the world has seen an acceleration in the way technology has affected society. Before this modern epoch of an 'Information Society', technology was utilised for a specific function, or two, eg. A water pump, or a locomotive. The simplicity of the applications of technology allowed for a perceived understanding of the ramifications of the technology in a social sense. Even extremely complex technologies such as an ocean liner or a precision timepiece were understandable in their general effect. Of course, it can be argued that such technologies were responsible for greater effects than the intended general applications. In America, the advent of a mass-produced and affordable automobile in conjunction with the subsequent drive-in movies was thought, by some, to be the major cause in a rise in the birth rate, the baby boom. Furthermore, it is evident that somewhat simpler technologies brought about fundamental changes in societies that go well beyond the obvious purpose of the technology. A timepiece for instance was for keeping track of the day, the earliest were water clocks used by monks to ensure they were making their regular prayers. As timepieces became portable and the technology was refined to allow for rough handling and greater accuracy they were put to sea and allowed for navigation beyond sight of land, and thus, were an enabler for systematised exploration and colonisation.

These hidden, or secondary, effects of technology are now being examined by academics as well as historians. Among these newly investigated effects in technological

innovation is technological 'convergence'. Convergence, as it relates to the field of Information Systems (IS), is a term that was invented to describe the coming together of computing and communication technologies [Dennis & Pavlik, 1993]. Sproull and Keisler [1991:11] define a similar concept 'Deviation Amplification', where the economic trends of the declining cost of computer technology and of long-distance communication have led to new and vigorous applications of the combined technology far beyond that originally envisaged by workers in either field.

Throughout history the convergence of various inventions has created new technologies, but now the potential for social impact seems, to today's observers, to be far greater. For example it has been shown that communication technologies that mediate social communication [Ford and Ford, 1995:542], alter socially constructed meaning and cultural dynamics within organisations. Tuman [1996:26] argues that the decline of print and its replacement by 'online literacy' has epochal significance "*.. not just a change in communication or technology but a change in civilization itself.*". Communication is at the core of social interaction and constructed meaning, and increasingly conversations are being carried out across geographically dispersed groups of people at a pace and quantity that would not have been possible without these new communication technologies.

A complicating dimension of the effect of a technology on society has arisen from new perspectives of examining innovations, in that the ways in which communication

technologies are utilised are not determined by the intended purpose of the technology [Fulk, Schmitz, and Steinfield, 1990; Lea, 1991; Poole and DeSanctis, 1990]. The technology may cause changes in sociocultural states, but existing sociocultural states are also likely to result in the technology being used and evolved in unanticipated ways [Kaufer and Carley, 1996:14]¹².

Effects of technologies on society are not just limited to the ones intended [McLuhan and Powers, 1989], indeed, technology cannot be understood by focussing attention on the rational effects that one expects, or wants to expect, from the technology. Technology is both socially utilised and given meaning through its use and depiction in society. Galvin, in agreeing with two leading commentators in the field of 'techno culture', says "*Penley and Ross are right to point to the fact that technology exists in fantasies and popular culture as much as it exists in what corporations and the military decide to produce.*" [1995:65]. This sociological, rather than technical, position is the perspective that was used to formulate the research proposal for this project.

This social approach is spurred by literary evidence that computerised asynchronous communication technology has some range of social effects including; diminished social cues, greater anonymity, and less status affect in communications. Mostly, these effects were reported in reductionist rather than interpretive studies and taken on a macro scale of use ACT's may show more prominent features such as an emancipation of the general

¹² Kaufer and Carley make some thoughtful comments about the Gutenberg era of print technology; however, their words seem to support the general contemporary argument about computerised communication technology.

workforce.

Barnes [1988] says that the nature of power is a characteristic of the distribution of knowledge, and it has also been commented that;

Power in organisations is based on what and who people know. Access to information is vital to those responsible for managing business operations. Electronic systems make it possible to distribute that information widely, cheaply and quickly. They can lead to much unsupervised information sharing. Network-based communications allow people to bypass traditional information gate-keepers and access information sources directly. These systems ignore traditional hierarchical levels by giving equal status to messages from all participants. Employees, through networking with others, may well be able to piece together more about the company than management would see as desirable. [Birchall and Lyons, 1995:89]

The rhetoric of modern organisational analysts similar to that just presented insinuates that ACT's could affect political structures in organisations, indeed there is already an agenda for studying technology and politics.

2.4.1.2 *Democracy and Forums of Discussion*

Further to the comments above, Pateman [1970] has argued that providing democratic forums will translate into a more democratic system within which the forum exists. Also, Watkins [1995] has argued that the informal social networks that exist in society are under emphasised in sociological research. From this general perspective an argument forms that technology that mediates social networks or that supports a forum of dialogue may have an affect on the underlying political structures of society. Specific work in this area [Ytterstad, Akelson, and Svendsen 1996, Shade 1995, and Ronfeldt 1992], suggests that sufficient scope should be made in the planning and undertaking of intensive research to allow for these sorts of political issues to arise.

Some of the preliminary findings of studies into email have suggested that there is some status effect minimisation [Sproull and Kiesler 1986, Clausen 1991, Mason 1994], and perhaps email does provide a more democratic forum than traditional forms of communication in hierarchical bureaucracies simply because of the ease of access to other individuals. Importantly, the structure of organisations themselves may be subject to independent forces of change. The argument that electronic communication technologies cause flatter structures or matrix organisations is depreciated when early descriptions of these hybrid organisational structures existed in the 1950's and 1960's;

In fact, the matrix was originally billed as the “obvious organisational solution” to the need to manage rather than minimise

environmental complexity while simultaneously enabling flexibility and speed of response. Proponents of these models argued that a flexible, adaptive, information-intensive, team-based, collaborative, and “empowered” organization was needed. [Applegate, 1999: 35]

Whether computerised ACT's are an enabler of flatter or more democratic organisations is something that needs to be explored alongside the caution that it would be very difficult to prove either way whether ACT's 'cause' changes to organisational forms.

At this point it is important to take a step back and rephrase the reality of what it is the intention of studying. So far the terms Asynchronous Communication Technology (ACT), computerised ACT, and generally, Communication Technology have been used, but the question about what 'a' technology is, is the next issue that I need to discuss.

2.4.1.3 *Conceptual Thinking*

Information Technology (IT), the backbone of contemporary IS, is not born of a rational science. This may be an arguable statement but one that is posited by Richard Coyne in his book “Designing Information Technology in the Postmodern Age” [1995]. Coyne distinguishes four conceptualisations of IT, which are not mutually exclusive, that he calls: conservative, pragmatic, critical, and radical. The conservative is characterised by IT as a medium for “*the transmission, conservation, and increase of data, information, and knowledge.*” [1995:1]. The pragmatic characterisation encapsulates the view of IT

as a tool and “*that they are extensions of the person using them.*”[1995:1]. Critical conceptualisations of IT incorporate the political and social dynamics of its use, resistance to be used, and the change in thinking that is brought about by its use. The last category for characterising IT is the radical. The radical characterisation “*unsettles any claims to its importance at all by showing that any ideas we develop about the centrality of information technology turn out to demonstrate the opposite.*” [1995:2]. The work of Marshall McLuhan [1989] typifies the radical perspective proposing that the natural transformation of a media technology in society ends up with ‘reversal’, where typically, society ends up using these technology in a manner opposite to that which was expected or designed¹³.

The history of IS research has largely ignored this diversity of philosophies of the creation of IT. IS research within organisations and societies often deals with the confluence of what has become termed the ‘hard’ technology and the ‘soft’ social dimensions [Avison, 1997:119]. However, the hardness of IT is a misconception based on the relative physicality of technologies in relation to societies hence the need for a different perspective that I will outline below.

2.4.1.4 *An Action Orientation*

The dominant history of IS research has favoured a scientific and reductionist perspective. Or as Olaisen puts it “*The conclusion is that information systems research*

¹³McLuhan uses the example of the telephone, which although originally developed for business use, later was chastised for keeping people from working.

has remained a trivial discipline grounded in logical positivism based on empirical evidence and a search for causal relationships" [1991:235]. Apart from limitations of the scope of research perspectives geographically [Galliers, 1991:328] there has been a general tendency to use a reductionist strategy in understanding social influence in organisations. This body of research is not in itself negative, however, the plethora of reductionist work at the expense of the synthesis tradition has been seen as unhealthy [Avison, Lau, Myers, and Nielsen,1999]. However, IS research has recently had a philosophical shift in thinking. A need to understand the social context of situations in order to design a technical system is not a new development but one that has not been adopted in research as it has in rhetoric.

Because synthesis and context dependent interpretive strategies are underdeveloped in rigorous IS research, I developed a research approach with a pragmatic and critical conceptualisation of IT in order to close the gap between the rhetoric of the social sciences and contemporary IS research and theory. A critically-informed [Jablonsky, 1991:297] interpretive research project called into light the use of hermeneutics and the dialogue of the broader social sciences was found to contribute some valuable concepts such as Social Constructionism.

Hermeneutics [Lea, 1991], which has been fleeting in the core of IS research, has fortunately been directly proposed for research into electronic mail (e-mail) and was considered to be a useful analysing tool for rich research. Lee as a critique of media

richness theory explains and demonstrates hermeneutics as a valuable aid in understanding the 'richness' of e-mail where the 'rational' media richness theory fails [Lee, 1993:13]. A philosophically connected frame work of Social Constructionism was suggested by Banville [1991], who proposed that legitimacy be used to study the transfer of IS and that the organisational change perspective offered an opportunity to learn about the interaction of the technology and the social system. Legitimacy is a term that Berger and Luckman incorporate into their conception of 'objective social reality'. It is the objectification of social norms and rules and therefore fits in well with the pluralistic notion of what is pragmatic, that which represents positive change to a position that although none of us deem perfect, all of us can live with [Rescher, 1995].

2.4.1.5 Virtual Worlds and Technology Policy

The motivation for the research is not confined to the epistemological gap between IS and other fields of social research. During 1997, when this project was being formed, there was a surge in 'chat' rooms and in general domestic connections to the Internet, meanwhile businesses were struggling to develop more sophisticated business solutions and competencies. These are important trends in communication technology that warranted researching, and can be categorised as two general social issues.

The first issue is of the 'Internet' in general and the massive growth of the electronic communication that goes across it. Attempts to characterise the Internet or to predict the

growth in size or usage across it have fallen short.¹⁴ The fact that the Internet lives apart from the physical network of wires and, black, beige, and grey boxes that comprise the hardware of the Internet has created a new 'virtual' culture. A nonphysical but highly interactive existence has evolved in our society, of which, every aspect that changes social patterns, work life, or education, needs to be investigated. This research project attempted to find changes in social communication and general interaction dynamics resulting from this pervasive use.

The second social issue relates to the diffusion of asynchronous communication technologies within business organisations. Policies for the use of such things as e-mail have differed greatly between organisations, ranging from total unrestricted access of all members to just a fragment of the personnel from a particular department or strata of the organisation. Trends in the usage and policies of organisations warrant investigation to determine potential changes to cultures, structures, and relationships within organisations. This component is essential in this research in order to increase the predictive quality of the research. The participation of the client organisation in this Action Research project influences the research study to look at contemporary problems and potential improvement.

¹⁴ Some estimations constructed in 1998 concluded that over 100 million Americans would be connected to the Internet by the year 2001; however, as at August 2001 it was estimated that there were 180 million users in the U.S.A. alone, and 524 million users world wide. (http://www.nua.ie/surveys/how_many_online)

2.5 Research Objectives

When I started the research project, I tended to think that I could improve how people used ACT's in organisations and society, but I was also critical of elevating technology to too high an importance. I was also critical of the overriding reductionism of the field and I believed a fresh perspective would have been beneficial. I may have started out on this critical foot, but reductionist theories informed me of the things that I should be paying attention to, and importantly, I have tried to allow for the creation of new knowledge unconstrained by the existing theory. My research questions, have been generated to test existing abstracted theory against a multidimensional reality and to be as observant as possible to capture actual use in meaningful ways. Explicitly then, my research questions can be phrased as follows.

2.5.1 Research Objective 1 - new theory

Create theory grounded in the expressions of individuals in the context of organisational life and related to the combined organisational and societal values of the research participants.

2.5.2 Research Objective 2 - existing theory

Establish an opportunity to compare the existing experimentally derived theory of ACT's against an actual social construction of the technology.

2.5.3 Research Objective 3 - reflection of method & repeatability

To develop a useful and purposeful method for IS research that could assist in addressing contemporary IS problems facing society.

Although the Action Research approach has a topic negotiated through participant interaction, and the nature of PhD research is also generally considered to be mutable, there was always an element of consistency in the desired outcome of the content of the project, and that is encapsulated in the following Research Question.

2.5.4 Research Question

In essence the underlying theme of the PhD project from inception through to write up can be described with the following research question.

“How does the cluster of technologies associated with Email change social interaction in an organisational context?”

Some elements of orientation did change, for example at the inception it was thought that Strategic Decision Making could be studied; however, some of the evidence from the interactions showed that the senior management were one group that were perhaps laggards at adoption. The project pragmatically shifted toward a more representative coverage of those organisational members that were using ACT's and hence may have experience of any social effects. Any changes to topic that did occur were most notably

attributable to the Action Research methodology that was used, a brief description of which follows.

2.6 Research Method

The methodology that was used in the major part of this research was action research. Specifically, Multiple Action Research Cycles that started as that described by Kock, McQueen, and Scott [1995]. This methodology is an extension of the one proposed by Susman and Evered [1978] which introduced the cyclic nature of the methodology.

The stages below comprise the major elements of the methodology, remembering of course that the research cycle at the core of the method can occur many times. Of vital importance, it must be remembered that the active reflection that is undertaken in an Action Research project can modify the research method and activities within it to better accommodate the needs of the participants. Peter Reason best explains this as the third phase of co-operative enquiry when;

The co-researchers will in all probability become fully immersed in this activity [the initiation of agreed actions] and experience. They may be excited or bored, engaged or alienated; they may sometimes forget they are involved in an inquiry project; they may forget or otherwise fail to carry out and record the agreed-upon procedures; or they may stumble on unexpected

and unpredicted experiences and develop creative new insights. This stage of full immersion is fundamental to the whole process. It is here that the co-researchers, fully engaged with their experiences, may develop an openness to what is going on for them and their environment that allows them to bracket off their prior beliefs and preconceptions and so see their experience in a new way. This phase involves mainly experiential knowing.

[1994:326-327]

The description below is the briefest structural description of the process that was adopted at the outset. Changes to sub processes and to components changed as the need arose and as the intervention dictated and are described in Chapter 4.

2.6.1 Preparation

Any new research area, one that is new to the researcher or the research organisation, requires some initial work to negotiate boundaries and provide theories and direction. Once the research has been initiated, the PAR cycles described below take place. Whenever the research project moves on to another location or group of people, some sort of preparation will take place as a form of orientation for the researcher and the research participants.

2.6.2 Multiple Action Research Cycles

The action research cycle involves five stages that are sequentially iterated:

- 1 Diagnosing.
- 2 Action planning.
- 3 Action taking.
- 4 Evaluating.
- 5 Specifying learning.

[from Kock et al, 1995]

Diagnosing is an activity where a problem or opportunity is established as an interim goal for the AR cycle. Action planning is the next step, where resources, participants, and organisational elements converge in a description of the AR intervention. Action taking is the purposeful implementation of the planning output, and evaluating is a reflective stage to determine the effects of the intervention. Specifying learning is an explication of the lessons that were learned from the entire process, and relies on the collection of data and of observation throughout the entire cycle.

2.6.3 Intended Output From Each Cycle

As each 'Specifying learning' stage is completed, the researcher initially creates a tentative model or evaluates a previous model against the collected evidence. As the discrepancies are diminished then generality is approached. When the breadth of the organisation is represented in the analysis then the theory can be said to be generalised.

The inclusion of two or more organisations will of course increase the potential for generalisation of the theory [Kock et al, 1995]. This form of output and facilitation can be described graphically as a traditional hierarchy as in Figure 4.

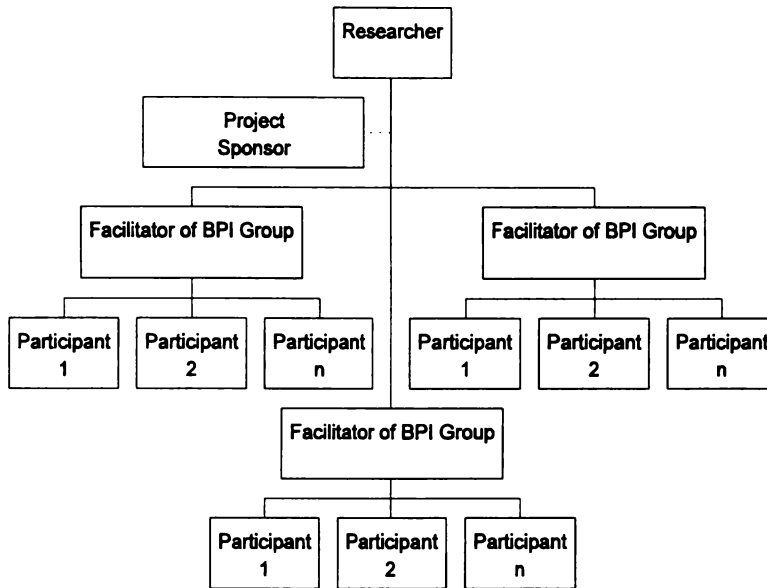


Figure 4 - Organisation of Research Project based on Traditional Hierarchy (adapted from [Stringer, 1996: 131] - figure 7.1)

Alternatively, in Participatory Action Research (PAR) the onus on the creation of knowledge does not rely solely on the researcher. Participants are involved in active reflection and analysis of the intervention to determine the value of the intervention and the extrapolation of learning. The participants also have control of the research process, but most likely will be assisted by an interested researcher or professional with appropriate skills (Figure 5).

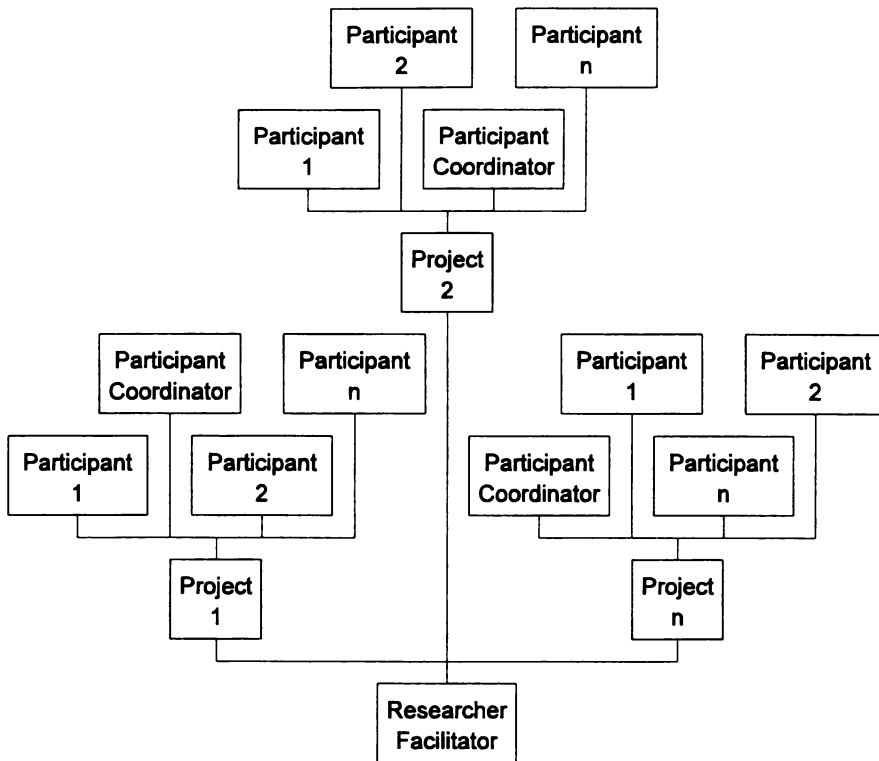


Figure 5 - A Community Oriented Structure (adapted for [Stringer, 1996:133] figure 7.3)

2.6.4 Organisation Selection

I participated in a colleague's action research project for one iteration as a group facilitator. This organisational interaction assisted me with the formation of research questions, choice of research method, and some raw data on which to draw for perspectives on email use.

My choice of a major research partner was predicated on convenience and acceptability.

A number of criteria were suggested in my initial proposal which had to be satisfied in

order for there to be a suitable synergy between my goals and the organisational context. The choice of organisation after that, quite honestly, was the first one that showed any enthusiasm. I made approximately 150 appeals for research partners through the telephone, email, and letter writing. Luckily I found a research partner through a university connection; however, my struggle posed a question of whether action research is possible at the PhD level due to the riskiness of not obtaining a context within which to make an intervention. The criteria that needed to be satisfied before the organisation was acceptable from my perspective were as follows:

2.6.4.1 Participating Organisation Criteria - Technology

The organisation had to have reached a certain level of maturity in their use of email. Although it was envisioned, that some in the organisation would be relative newcomers to the technology. While the existence of email technology within the organisation was deemed to be essential, other technologies, such as discussion list servers, bulletin boards, and calendaring systems were all deemed to be desirable.

2.6.4.2 Participating Organisation Criteria – Change culture

The *Participatory* Action Research Methodology generates a negotiated action, and within this project this took the form of planned interventions in individual business contexts (in different facilities). The planning and action processes were undertaken by both the researcher and the research client and therefore were subject to emergent negotiations amongst the research participants including myself. With this arrangement

of research it was important for me to find an organisation that was open to exploratory and emergent enquiry. I was trying to find an organisation that was willing to give its employees autonomy to investigate their own systems and behaviour. Of course, in my conversation with executives most of this dialogue was phrased in terms of organisational learning and technology management being the vernacular that was available to us all.

Once I had found an organisation that both had the level of technology that was appropriate and an affinity to the type of research that I wanted to conduct, it was a matter of starting the research on the first day of the contact. At the very beginning, this mostly entailed keeping good records of my conversations and meetings with the client, but also entailed exploration of both the context and the research method.

2.6.5 Data Collection

As an action researcher it was essential to keep a diary in which I noted my interactions with the research participants, this in turn enabled me to improve my interactions and enforce the robustness of process that I sought. I attended at least seventeen business meetings (two at a distant facility lasted six hours, with an additional eight hours in a car with participants). Unrecorded formal interviews were undertaken on sixteen occasions, briefer face to face, telephone, or email communications occurred frequently from late 1997 to late 1998. Data was also collected in twelve taped interviews between mid 1998 and early 1999. Some participants were interviewed a number of times, and others were

only interviewed once; however, only the taped interviews form the basis for the grounded theory analysis, described in Chapter 6, which is then compared against the other data for consistency and completeness and presented in Chapter 7.

I also had the transcripts from a previous action research cycle that I collaborated on, which was in a related area, to make comparisons for cultural and theoretical differences or similarities and to check for ethnographic rigour.

2.7 Limitations of Scope and Key Assumptions

The intention of this research was to use a large single research client to develop an Action Research enquiry that could lead to understanding the use and efficacy of electronic mail. To be able to generalise about email use in all organisations is beyond the scope of this project. However, to develop a method that other studies may utilise in order to build a richer, more generalisable, picture of electronic mail use is a purpose of the research endeavour described in this report.

Although it is not usual for the methodology of a study to be a significant part of the thesis topic, in this case the reflection on the Action Research methodology is of particular interest, and the particular nature of the knowledge that was gathered is quite different from that which is normally gathered in this field. Wholly participatory methods are not common in Information Systems research, and generally scant in

Doctoral work. The combination of participator directed and subject emergent research was not conducive to traditional propositional thesis supervision or structure. Any learning that can be shed on this method will clearly be beneficial to future Doctoral students, and therefore, pertinent to the core of the learning in this thesis project. However, the method and the topic of discussion are far more deeply connected than the addition of a particular flavour to the knowledge creation process, and replication of theory is only truly relevant to reuse of method in AR.

2.8 Conclusions

I have constructed this research in order to re-evaluate the direction that research into email has been taking. I intentionally set out to conduct research that was not biased by academic conceptual thinking, but that was a critical reflection from within an organisation. My intention was that this research could fulfil a handful of objectives, both academic and practice based, for improving use and research into electronic mail. Whether I have succeeded with my plan is partially borne out in this document, whether it is readable and stimulates replicable work in the area. Beyond this document, there is a mission to publish the findings of this research in both trade and academic journals to achieve the goals of the research – but this endeavour, although part of the research process and a significantly important requirement of this research process is not part of the assessable output for this degree. Needless to say, if you find any resonance with this text then more detail may follow in appropriate media.

2.9 Outline of the Report

This document represents my last reflection in an action research project that spanned two years of organisational participation. The journey through a doctoral Action Research project is necessarily a long and arduous one with substantial uncertainty at the outset. This thesis is the culmination of my journey and a summary of my learning from beginning to end.

Certain aspects of an Action Research project make the reporting of the results different from that of an experimental or hypothesis-testing project. Therefore, in addition to traditional chapters, Chapter 5 is committed to describing the organisational contexts of where the data was gathered, as it is important to build a picture of 'where the data lives' [Chenail, 1996]. Much of the evidence that is useful for future iteration of Action Research cycles is described in this chapter and because of the longitudinal nature of Action Research this description will be chronologically ordered.

Immediately after this *Introduction* there is a section on *Prior Work* followed by a section on the *Research Method*. The *Organisational Context* mentioned above initiates the research deliverables. Having achieved this raw presentation of the contexts of the research the *Data Analysis* section can concentrate on the process of theory building from summaries and significant instances while the reader can relate these aggregations to the previously disclosed contexts. The remainder of the thesis will consist of the

major *Results, Conclusions, and Discussion and Future Research.*

3 Prior Work

Electric circuitry has overthrown the regime of 'time' and 'space' and pours upon us instantly and continuously the concerns of all other men. It has reconstituted dialogue on a global scale. Its message is Total Change.

[McLuhan and Fiore, 1967:16]

3.1 Introduction to Prior Work

I set out my motivation in the Introduction chapter, of being placed in a world where technology is changing our lives, and wanting to understand what the future will bring us. I endeavoured to find predictions in the existing body of literature and this search is represented here. Directed by the fundamental tenets of grounded research as described in the introduction, my investigation of the prior research into this topic has been broad. I also must say that email research is an emerging field and throughout the course of my project, there were new publications that bore some light on my questions. Most notably, when I finished the field research and took a step back I found some

revelations and surprises in the contemporary works of literature. Some of this work is presented in the Discussion and Future Research chapter.

The IS research into the social impact of communication technology prior to undertaking the research was limited, and I do not stand alone with this opinion. Kling [1996:2] observes that although many writers "*have speculated about the effects of new technologies on work life ... there are currently few empirical studies of changing forms of work that support these speculations*". The main limitation of research into communication technology is that the focus has remained on what Sproull and Keisler [1991:1] call '*first-level*' effects, those effects that are efficiency effects. The '*second-level*' effects are the ones that are evident in the social system, a change in the social interaction. Sproull and Keisler [1991:7] identify four lessons when thinking about the potential consequences of new communication technology:

- A. The possibilities of a new technology are hard to foresee.
- B. Unanticipated consequences usually have less to do with efficiency effects and more to do with changing interpersonal interactions.
- C. The second-level effects often emerge somewhat slowly as people renegotiate changed patterns of behaviour and thinking.
- D. Second-level effects are not caused by technologies operating autonomously on a passive organisation or a society.

Whilst the second point (B.) will be treated at length as this needs further investigation in the way it relates to and may moderate the concepts of Reversal, Deviation Amplification, and Evolved Effect, the first point (A.), on the other hand, can be dispensed with popular notions. Just how hard it is to foresee the possibilities of new technology and how wrong people can get it wrong has been highlighted many times. In my undergraduate degree I noticed a list of predictions about computers on my lecturer's door, not dissimilar to the following¹⁵;

Where a calculator on the ENIAC is equipped with 18,000 vacuum tubes and weighs 30 tons, computers in the future may have only 1,000 vacuum tubes and perhaps weigh 1 1/2 tons. Popular Mechanics, (March 1949)

I think there's a world market for maybe five computers. Thomas Watson, chairman of IBM (1943)

There is no reason why anyone would want to have a computer in their home. Ken Olsen, President of Digital Equipment Corporation (1977)

640 K [of computer memory] ought be enough for anybody. Bill Gates (1981)

Well, sure, the Frinkiac-7 looks impressive, don't touch it, but I predict that within 100 years, computers will be twice as powerful, 10,000 times larger, and so expensive that only the five richest kings of Europe will own them. Young Frink of The Simpsons (circa 1960)

¹⁵These quotes were replicated on multiple web sites and are commonly considered to be authentic; however, I will have to admit that there is a significant level of doubt as to the accuracy and authenticity of any one quote. Taken together they do provide a very illustrative and commonly accepted perspective on technology prediction.

People who try to predict the future based on technological capacity run foul of the wrath of human illogic. The *Frink* quote above is from the popular television cartoon *The Simpsons* and illustrates the popular notion of what we commonly understand about the fate of predictions about technology, as the humour reflects a well thought out resonance with an unstated underlying social tension. Betamax© video tape was said to be technically superior to VHS©, and was the standard for commercial studios, but was relegated to the ranks of also-rans in the domestic market because VHS© had a superior edge on the release of titles. Microsoft™ products continue to dominate the software industry despite very vocal opposition and a growing raft of cheaper, and arguably better, products.

I will illustrate different ways of understanding technology and change, and why it is difficult to separate the technology from the social context of its' use. An installation of electronic mail, for example, is not a precisely replicable technology because it is context specific, and it does not exist as a separate entity that can be removed and installed somewhere else. Two examples of the same e-mail system, one in a fast food company and one in a legal firm, will evolve into disparate *things*. In this prior work section I shall explore some of the areas of literature devoted to both the research into electronic mail, and ACT more generally, as a concrete technology independent of social context, and also the theorising and synthesis work that incorporates the multi disciplinary nature of understanding technology in this socially embedded form.

This Chapter was intended to be bifurcated by the need to cover some specific research into email and to rightly cover the prior synthesised thinking into the continuing use and effects of email and related technologies on human systems and society.

The natural stages of Action Research of: Planning > Action > Reflection > Learning, provided a structuring tool for this section. The ground work *planning* is the Precedents section, the Empirical Research whether informed by positivism or interpretivism is *action*. The Conceptual section describes theory from books and other intensive literature that has the element of *reflection*, and my assimilation of this reflection, in the Integration section, is my *learning*.

3.2 Precedents (Preparation)

At this stage of the literature review which sets the preparation and context for the following works, I endeavour to describe the precedents and presuppositions of the body of literature on electronic mail and the host of related technologies described in the Introduction.

For want of a structuring device for this preparation, a rough set of natural characteristics of organisationally implemented electronic mail are needed. Without trying to get too complicated about this list, as it is only a place to start, we simply have to picture an instance of communication and decide what actors and broad contexts are being studied.

Of primary concern you have the actors who are communicating, in the context of this study we can conceive of these actors as being organisational members who communicate in dyadic and group relationships that have some permanence or are quite dynamic. The organisational members use language to communicate, and from a New Zealand perspective this will paramountly be New Zealand English. The 'Computer' is generally a desktop personal computer or laptop computer in most organisational use settings. Areas that could inform this study are then, at the lowest denominator;

- ☒ A limited set of phonetic languages, pervasively English, is used and the context of this study.
- ☒ Many literate users, each user with knowledge of some of the other users.
- ☒ Acts of communication between users.
- ☒ Computer platforms, commonly 'client-server' architecture.
- ☒ Application software and issues related to using it {ie. Human Computer Interaction (HCI) issues of symbolic interaction}

The planning stage sets out some core facets of these most basic characteristics. This process is eminently useful as email mediates human interaction and insights into the process of communication, language, and culture, from a basic level may help us in our current quest for knowledge at very specific levels. The material from the Action section then describes the empirical research which intentionally targets email use and characteristics.

3.2.1 Written Language and the Nature of Literate Users

To start from a basic concept of communication you need to set out some of the context for the development of language. Knowing a little about how we think and feel, how we represent knowledge and pass it on, how we have changed, and how we are different is important, it is vital to our vision of email and other computerised ACT's. Researching email from a simplified perspective often hides some assumptions about the language context of the technological artifact. Most importantly, we should not hide how complex and tacitly multiprocessing our minds are in order to make our research simpler. The following descriptions are an exploration of some of the presuppositions I have made about email users.

3.2.1.1 *Phonetic Language*

The displacement of the 'Oral Tradition' in thinking and social interaction by the western phonetic alphabet was seen by some as limiting thinking;

The discovery of the alphabet will create forgetfulness in the learners' souls, because they will not use their memories; they will trust to the external written characters and not remember of themselves... You give your disciples not truth but only the semblance of truth; they will be heroes of many things, and will have learned nothing; they will appear to be omniscient and will generally know nothing.

-Socrates, "Phaedrus"

[McLuhan, 1988]

The creation of this non-remembered learning can be thought of as learning a figure without the ground, or non contextual thought. This abstract and structured figure minus a ground is a predominance of left-hemisphered thinking populations of which North American English is the exemplifier [McLuhan, 1988:70]. A traditional approach in IS research, as DeSanctis and Poole describe [1991], illustrates this decontextualisation;

We regard technologies as outside ourselves, objects to which we must somehow relate. Objectification is useful, in some respects. ... Along with objectifying technologies, there is a tendency to decontextualise them, that is, to ignore the situation and circumstances surrounding their use.

The objectification that DeSanctis and Poole describe is a 'physical science' ontological conception of objects rather than the Berger and Luckman [1966] conception of social objectification. However, such a tendency to scientifically make technology objective has its perils. Kaufer and Carley when studying print technology suggest that historical analysis is superior to experimental methods because "*The question is too large for the laboratory*" and,

because there is a significant gap between the evolution of print technology from an engineering perspective on the one hand ... and the metaphysical questions about consciousness and consciousness-raising that

print, since Gutenberg, was supposed to have spawned. [1996:14]

Kaufer and Carley [1996] also contribute to the generalisability of Sproull and Kiesler's [1991] four lessons about communication technology presented in the introduction to this section, although not necessarily attributable to a specific lesson it does suggest support of lessons B, C, and D, in that;

Tracing the sociocultural influence of any technology is fraught with problems. First, many of the influences cited are likely to be too large and diffuse to be tested under experimental conditions in the laboratory. Second, the technology is likely to be, at most, an accessory to many other influencing factors rather than a singular cause. Third, insofar as the technology can be isolated as a factor of influence, the direction of the influence is often two way. The technology may cause changes in sociocultural states, but existing sociocultural states are also likely to result in the technology being used and evolved in unanticipated ways. [Kaufer & Carley, 1996].

Carrying on the progression of communication through history takes us to an expansion of Western¹⁶ language into media studies that have always been implicitly available through critique of art but which were explicitly incipient with the invention of

¹⁶This research was never intended to be cross cultural and is restricted to a western phonetic alphabet domain.

photography and film. Early photography had critics saying that the frenzy with which photography was being adopted and the multiplicity of the images that were being circulated was having damaging effects on art and appreciation of the world, changing the perceptions of people. The Daguerreotype image by the mid 1850's propagated millions of the shiny little pictures of almost every aspect of life and death [Nelson, 1996].

Media studies have become more organised and purposeful as more media were incorporated into mainstream society. Television was the first medium to undergo detailed and prolonged investigation, and the jury may still be out. The seminal theorising and synthesis work by McLuhan epitomises the media study literature, some of which is included in this chapter in the Reflection section. The important aspect of the McLuhan tradition that needs to be aired at this stage is the visual space and acoustic space of perception, corresponding practically with left brain and right brain hemisphere dominance, respectively. Visual space is associated with western phonetic alphabet and written language, linear thought and abstract structuring. Acoustic space is associated with spatial activity, spoken language, holistic thought, and intuition. Having a mass audience of the population subjected to different media which inherently impinge on a certain hemisphere of our brain will heighten the senses and thinking in this area. Traditional literature has been replaced by television and there is some evidence that western populations are moving from left hemisphere dominance to right hemisphere dominance [McLuhan, 1964: 335].

3.2.2 Acts of Communication in Email Emergence

Banville (1991) commented on the use of email at a conference in 1991 as an experimental and uncertain affair. It is with some trepidation that I classify 'emerging' stories of email use such as this one. Email has actually been around for about thirty years, enough time, according to any reasonable person, that it would have reached a certain level of sophistication. Prior to steam power for example, mills and manufactories were located near rivers or in rural areas because of nearness to raw materials and power. Less than thirty years after the introduction of the rotative steam engine it could be seen that there had been a complete change in the distribution of production and the location of the population [Ashton, 1948:57]. One would assume that 30 years after the introduction of email there would be a similar monumental change in the way we live. Maybe email has created changes that have come too subtly, and piled on top of each other these changes are of epochal significance. However, given that email has been around for almost as long (or longer depending on your definitions) as the Internet we should already have a good idea of where we are heading. Importantly, the scale of the diffusion we are talking about with email is vast. The literature talks about the Internet and email as having a global and societal span – which is materially correct. Therefore, email not only is spreading globally, but also through different societal structures and groups. Through different industries, through *for public good* organisations, state owned enterprises, private and public companies email has diffused. From the operational control and management level email has spread both up and down and across into organisational functions, and acts of communication undertaken on email

range from an array of business communication through to personal messages of support or reprimand and as personal as engagement or death notices.

3.2.3 Computer Platforms and Architectures

Email is on its long road to diffusion and for the first twenty years have affected a small fraction of the population in western nations restricted mainly to universities and research institutes, the last ten years have seen the bulk of the emergence. In fact, the exponential growth of people being 'connected' to the Internet has not yet slowed, and it is really only in the last several years that growth could be measured in whole percentage points of the population.

Email started off as mainly a text based application that ran on mainframe computers, and up to the late eighties and early nineties, were connected via leased lines and were mainly proprietary systems [Thompson, 1997]. Email has transformed with SMTP, and MIME, and has grown to be a distributed client / server, multiple vendor compatible technology, although compatibility being usually external rather than internal [DiSabatino, 2001:26].

At the time of this research project the organisation had implemented a Microsoft Exchange™ server and Microsoft Outlook client configuration, which is typical of the common client / server architecture and software applications used for ACT's. In late 1997 and early to mid 1998 Outlook™ and Lotus Domino™ split the market [Fusaro,

1998:77].

Given these basic assumptions about the context of computerised ACT's the next task is to outline the research that has been undertaken to determine the relationships and interactions between them. The following Empirical Research section outlines the major areas of research into this topic, working in some ways toward the basic notions of relationships that are held by academics in the area.

3.3 Empirical Research (Action)

As implied in the introduction to this chapter Email emergence is documented throughout an extended period. Literature from the mid eighties [Sproull and Kiesler, 1986] to the late nineties [Kendall, 1997] typifies this long honeymoon that we have had with email. Paradoxically, studies as late as 1996 are still termed 'exploratory' [Teng and Calhoun, 1996] whilst earlier studies have used a base of 'experienced E-mail users' [Lea, 1991] and are aimed at a more mature stage of email use. An important period for email emergence is the early nineties when ISP's were first introduced¹⁷. However, New Zealand's first ISP started registering members in May 1996.

Prior to the work on Email characteristics Daft and Lengel developed a theory of media

¹⁷"AOL began in 1985, originally founded as *Quantum Computer Services*. It officially became *America Online* in 1989. Four years later, in 1993, AOL had only 500,000 members." [<http://www.aol.com/nethelp/misc/history.html>, 2000]

richness and structural design building on earlier work on information requirements and task characteristics. Daft and Lengel describe a two-dimensional grid that is partitioned by valence of equivocality and uncertainty [1986]. Although not commenting on email use in this study, other researchers have taken Daft and Lengels work and used media richness to study the difference between email and face to face communication and other comparisons. A survey and critique by Lea [1991] outline the major problems with this line of research, mainly that the rationalist assumptions with these cross media comparisons are not matched by the cognition of actual users of email systems.

3.3.1 Email Characteristics

Email has become more sophisticated since its inception. Command line mail readers have been replaced by GUI software products and the standard mail protocol has expanded to accommodate multiple functions¹⁸ that were not present in some of the earlier studies into email. Within most organisations the type of software being used may enable more functionality than just email. Outlook™ or GroupWise™ for example both have internal calendaring, address book, filters, automatic respond functions, and other personal productivity features. However; even if some of the research into email was undertaken on distant relatives of what we now use, I would like to inventory some of the specific characteristics that have been studied in the email research agenda. Each of the following characteristics has a reference to at least one study with an example of the findings or statement about the outcome; however, these categories are not fully

¹⁸Such as additional header information for discussion list servers, html presentation in email readers, and predominately the use of MIME since it's introduction in 1992 [Rose, 1993:208].

populated and are not necessarily mutually exclusive. The main aim in summarising these works is to present the most available empirical works and create a picture of what the typical IS academic believes about email and ACT's.

3.3.1.1 *Status Effect Moderation*

A tradition in the study of organisational technologies and a subsumed tradition within IS is the study of differential influence of group members when their interaction is in some way mediated by that technology. No general consensus exists in the IS research as to whether differential influence is broadened or narrowed. People with different backgrounds have been found to be able to discuss things more freely [Sproull and Kiesler, 1986], whilst Adrianson and Hjhelmquist found no difference between the equality of members in face to face communication and CMC (computer mediated communication) [1991: 294]. However, in contrast others have found that email can lead to more equal communication [Clausen 1991, Mason 1994]

It is difficult to bring group pressure to bear on someone who cannot see frowns of disapproval. Communication by computer thus enhances the sense of personal freedom and individualism by reducing the 'existential' engagement of the self in its communication. [Feenberg, 1989:25].

The academic community is mixed in it's opinion of the affect of ACT's on differential influence or status effect minimisation.

3.3.1.2 Lower Formality

In presenting evidence, that follows, a strong case emerges that shows the academic community believes email and associated ACT's provide a less formal communication 'channel' than written correspondence. Informality in a communication channel, which can allow an increased socio-emotional content, has been defined as "*communication messages that show solidarity, tension, tension relief, agreement, disagreement, antagonism, and giving or asking for personal information.*" [Rogers 1986].

3.3.1.3 Task Suitability

A connection between the Group Decision Support Systems (GDSS) literature and ACT's in general is the research into group process. Because GDSS's have been designed to mediate group processes from a normative perspective, there has been research into these normative process criteria. In a study of Electronic Communication Technologies (ECT's), Young suggests that email is more suited to certain stages in projects than others [1996:24]; however, it is generally considered to be an effective form of communication. The stages in this study that were seen to be strongly supported by this technological cluster {telephone, fax, voicemail, and email¹⁹} were the bulk of the middle ground of project work; startup, implementation {technical and administrative}, management, and completion. The creative stages of project inception, team building, and the final stages of wrap-up were not seen as being supported overly well by ECT's

¹⁹It is important to note that in this particular research the groupings of asynchronous and synchronous ECT's together into one technological cluster offers an insight into the perceived relative relationships of email with the telephone, voice mail, and fax (close relationship) and face to face communication (distant relationship).

as a replacement for face to face communication.

However, King and Xia suggest that email is more appropriate for “*several tasks such as getting to know someone, staying in touch, resolving disagreements, and making important decisions*” [1997: 897], which would seem to have some elements of the tasks that Young found as being not so suited to email. Young is supported by Adrianson and Hjelmquist who found that “*more complex functions, such as resolving disagreements, persuasion and getting to know someone, got the lowest ratings in CMC*” [1991:293].

3.3.1.4 *Communication Efficacy*

Teng and Calhoun [1996] studied organisation computing (computing and communications technologies - including email) and it's affect on operational and managerial decision making and found moderate to strong support that Information Technology and Communication Technology contributed to increased information usage, higher decision efficiency, and organisational communication related to decision making, makes a job more complex, decisions more routine, and improves decision effectiveness.

Although Young [1996:27] says that electronic communication technologies can “*play a critical role in obtaining work-related information in a timely and effective manner*”, which supports other studies and directly supports the topic of this thesis, a research project that focuses on efficacy as a product of individual wants rather than of an intended effect is rare, if not non existent. The predominance of value laden research

objectives orbiting the IS professional's consulting practice has determined the good and bad aspects of these communication technologies in research agendas. Marshall McLuhan gives us a warning about not being fully conscious about an effect of a communication technology in the introduction to *The Gutenberg Galaxy*;

The theme of this book is not that there is anything good or bad about print but that unconsciousness of the effect of any force is a disaster, especially a force that we have made ourselves" [1962: 248]

3.3.1.5 *Decision Speed*

The time it takes to make a decision using ACT's has been a focus of some experimental research. However, the outcomes of the studies conducted thus far, have been variable. Information timeliness and general decision efficiency were perceived to improve through the use of communication and computing technologies [Teng and Calhoun, 1996:700-701]. In contrast, Information Technology (IT), in general, was found to slow down decision making process [Benbasat and Dexter, 1982; Benbasat and Shroeder, 1977] or not to effect it at all [Sharda, Barr, and McDonnell, 1988].

3.3.1.6 *Specific Social Presence Characteristics*

In a low bias method, Lea found that email was perceived to be informal, asynchronous, and impersonal.

E-Mailing was perceived to be a written, asynchronous form of

communication, which is spontaneous and informal. It can serve for either inconsequential or important communications, and be directed at particular persons or undirected depending on the circumstances. It was also felt to be slightly impoverished and impersonal. [Lea, 1991: 166].

3.3.2 Choice Between Communication Channels

Media choice models have a general precept that communication channels have different characteristics and that these will affect the choice of a channel to be used for a particular task. Social context cues [Sproull and Kiesler, 1986], media richness [Daft and Lengel, 1986] and media experience [King and Xia, 1997] could be said to have effects on the choice of media. However, other researchers have suggested that the rationalist assumptions in this field of study are inappropriate [Lea, 1991].

3.4 Conceptual (Reflection)

The most prominent of the email theories of use is the media richness theory, which has also suffered the most criticism. Perhaps the reason for this is that the theory is too tidy and encompassing, and heavily sponsored by the technological determinist perspective. Comparisons between email and other forms of communication technology are a major focus of IS research. This distinction may be useful for some purposes but may not be the most important effect of these technologies, this research only tells us when someone is likely to use the technology, not what it does, or can do over time to organisations and

society.

A similar comparison would be to compare different types of transport. Comparing cars and buses, or comparing cars with walking, in terms of task suitability may tell us more about the individual than about the specific technology. There may be more information about the social structures and cultural beliefs associated with the decision to walk or drive, and drive or bus, than rational choice could detect or predict. This section fills the gaps between the predominant reductionist tradition in ACT research and the broader social research tradition by covering meta and explanatory theories of human interaction and electronic media.

An example of a factor that has not been addressed in the media choice literature is creation of cognitive space by a communication channel. Television creates channels which are brands, and scheduling {kids programmes, adult time slots, weekend television etc.}, as well as creating specific genre and clichés. Letter writing has unique modes {letter of; application, complaint, love, notice, pending action, disconnection} and these in turn have specific rule sets that instruct the writer and reader alike. Email groups exist, whether they are coded into the server software or whether individuals create their own affiliations. Email also has different genre {FYI, notices, announcements, formal, conversation, humour, debate, discussion} and these genre may determine the association with specific long lived virtual groups.

3.4.1 Media Genre and Genre Repertoire²⁰

Yates, Orlikowski, and Okamura [1995], and Orlikowski and Yates [1992, 1994] developed the concept of structuration in terms of media genre. Media genre “*conceptualize the communication patterns that emerge over time when individuals’ communicative actions interact with their social context and the media at their disposal.*” [Orlikowski et al, 1992]. While genre repertoire is the collection of commonly shared genres that members have about how to communicate within their community [Orlikowski, et al1995].

Prima facie these different modes of communication, different cognitive or virtual spaces and different genre, do not create a collection of interchangeable media. A discussion list server could not be exchanged for another media of communication that does not have a recognisably similar cognitive or virtual space and a similar genre. One person might choose to discuss business while playing golf while another may choose to visit someone in their day to day routine - the two interactions are both face to face, but they will also produce different evocations and feedback.

Further, it was widely thought that email would change decision making in organisations, make organisations more democratic, and emancipate communities. Other theologians from non IS disciplines have placed email and electronic communication change in a much more significant light, and the following section builds from the narrow to the wide

²⁰Media Genre was not investigated prior to the research, but was explored after the analysis. An explanation of this process is presented in the Results Chapter.

in some of these concepts.

3.4.2 Diffusion of Communication Technologies

Rogers is the prominent researcher on communication technology diffusion [Rogers, 1983]. Some of the major elements of diffusion as it relates to this study are the social influence factors of technology adoption, the critical mass of the adoption [Markus, 1990], or at least the 's' curve of adoption, and the suggestion that certain individuals in organisations have significant influence over adoption decisions.

Some of the diffusion literature assists in a global understanding of where email may be with regards maturity, rather than telling us anything about email itself. In the context of this research I am more interested in the diffusion literature where it describes social influence in adoption decisions as this may assist in understanding perceptions of usefulness. Rogers [1983] describes the adoption decision in terms of individual influence in the form of mimicking the behaviour of another individual who has already adopted. Of three types of social influence {coercive, normative, mimetic} mimetic is most prominent in the diffusion literature. Normative influences capture the media choice field above, while both coercive and normative influences in both adoption and use, are covered in the next section in the form of the concepts of Issue processing and legitimacy respectively.

3.4.3 Communication Technology Theory

Contractor and Eisenberg [1990] propose "a recursive model of network involvement and media Use in organisations" as shown in Figure 6 to help us to explain communication use. The inclusion of *Social Information* in this recursive model, and recognition of the importance of both perceptions and performance patterns relate highly to both Giddens

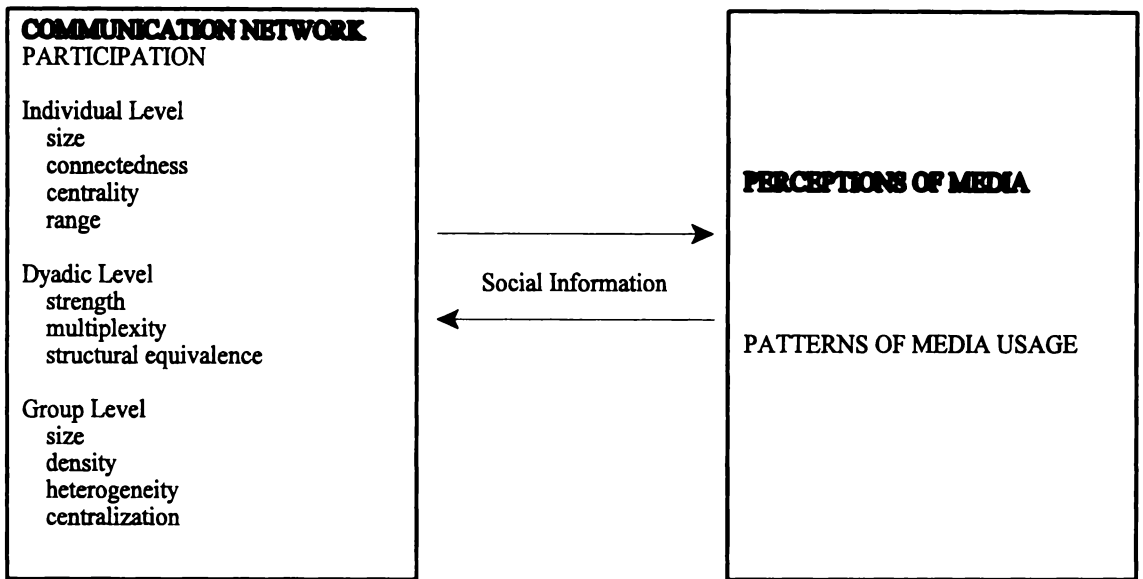


Figure 6 - A recursive model of network involvement and media Use in organisations [Contractor and Eisenberg, 1991]

structuration theory and Berger and Luckmans' social constructionist theories. Constructionism relates strongly to the body of work on institutions and Kling and Iacono [1989: 7] have argued that this body of theory is relevant to computer-based information systems. Orlikowski, Yates, Okamura, and Fujimoto [1994] used *metastructuring* to study technology-use mediation, which they define as;

the deliberate, organizationally-sanctioned intervention within the context of use which helps to adapt a new communication technology to that

context, modifies the context as appropriate to accommodate use of the technology, and facilitates the ongoing usefulness of the technology over time.

The Orlikowski et al. research reported above is an intervention oriented perspective on social influence, and as such has significant theoretical implications for the social and coercive construction of technologies, and also ties in tightly with adaptive structuration theory and social constructionism. This is a major and recurring theme that is also discussed in the remainder of this chapter.

3.4.4 Adaptive Structuration Theory (AST)

Poole and DeSanctis working in the field of Group Decision Support Systems (GDSS) presented a conceptualisation of information and decision processes facilitated by GDSS as emergent [1990]. The GDSS technologies have been designed to organise and facilitate group decision making, by changing the patterns of communication and decision making. Structuration relates to the process used by social groups to create systems over time [Giddens, 1979]. AST uses the concept of structures which represent social rules and devices which are appropriated but which can be related to Berger and Luckman's concept that high order legitimacy is related to representations and associations. In some ways it is difficult to compare these competing theories because they lie on top of one another, at the single moment they are the same but incommensurable. The Adaptive component of AST is such that the technical features

of GDSS that are actually employed are modified by the social group in their use [1990: 179]. Structuration theory and adaptive structuration theory are a common ground between the total social constructionism of Berger and Luckman [1966] and the objectivity of technology that Poole and DeSanctis are attempting to contextualise in that AST is attempting to decipher the “*choices that group members make about what features of the technology to use and in what fashion*” [Fulk & Boyd, 1991:418]. So, although Poole and DeSanctis remind us that “*we forget that users constitute and give meaning to technologies. Until applied by a user in a specific context, a GDSS or any other technology is simply dead matter*” [1990:178], AST carries forth the object of the technology in terms of features that are available. This mediation of the social and the object is important in GDSS research as there is theory backing the creation of features, and that features determine the marketing, training, and product, as much as the social need. AST has not been used widely beyond the GDSS area; however, as this area does incorporate a large element of communication, albeit structured and organised into decision process tasks, there may be some advantage in generalising this theory to other more unstructured communication technology fields.

3.4.5 Communication and Decision Making in Organisations

From a social constructionism perspective, communication *is* organisation, but from other philosophic positions that do not rely on this epistemology, communication is still seen as a significant part of organisational processes.

... communication forms a large part of planning and group decision-making activities [Rathwell and Burns, 1985: 257]

Decision making in a broader definition of significant, intentional, organisational change can be thought of as taking place in the context of an ongoing conversation [Ford and Ford, 1995:541]. From this perspective decision making is a social phenomena and highly dependent on communication channels and systems. Jackson outlines two trains of thought that tie together social interaction with decision making. Firstly, the analysis of the composition of top level teams can have predictive powers for strategic action²¹.

strategic leaders do not act in isolation; strategic leadership occurs within a complex social system of multiple leaders with multiple agendas- both private and public-that reflect multiple realities and the needs of multiple constituencies. [Jackson, 1992:346]

And secondly, that strategic decision making does not necessarily focus around a definable decision process but can be related to 'issue processing'.

Strategic issues engage executives in a variety of activities, all of which can be influenced by the characteristics of the group of people involved in issue processing. The phrase "issue processing" is preferred

²¹"Several reviews ... have reached the conclusion that heterogeneous groups are more likely than homogeneous groups to be creative and to reach high quality decisions." [Jackson, 1992:355].

over "decision making" to recognize that executives' issue-relevant activities often are unstructured, may not be focused on clear objectives, do not unfold rationally and linearly, are symbolic as well as substantive, and involve power struggles, politics, cognitive biases, retrospective learning, and self interest. [Jackson 1992:349].

This relates directly to what Narayanan and Fahey previously defined as the '*evolution of coalitions around issues or conflicts*' [1982:25]. These issue processing groups can be identifiable or a collection of unstructured interactions, the boundaries of interaction and loyalty are assumed to be fuzzy and unstable [Jackson, 1992:350], therefore the group of individuals involved are not necessarily a team but a group of individuals who persuade and are swayed through communication systems in dyadic and group interactions. The importance of the social influence orientation in decision making is reinforced by Barry and Watson [1996] who say

In organizational life, influence as goal-driven interpersonal behaviour is central to the attainment of organizational objectives. At a macro level, political processes, including the exercise of influence, are mechanisms by which organizations resolve conflicts among competing interests... At a micro level, individual actors seek to manage the opinions and activities of others in the pursuit of both individual and organizational goals.

Harrison [1994:248] points out that the study of interrelationships in business, being the primary focus of research, has been confined to hierarchical bureaucratic business structures. And in an increasingly democratic world the conspicuous autocratic nature of hierarchical organisations is an irony, although there is a growth in alternative forms of organisation [Eisenberg, 1994:275]. There has been some progress on research of worker emancipation where "*foremost among the organizational antecedents [of empowerment] is the general adequacy of information channels running throughout the system*" [Albrecht, 1988 quoted in Chiles & Zorn, 1995:18].

The logical conclusion to be drawn from the literature on decision making and communication, is that communication in decision making is not a formula event or a rational task. Politics and social influence play an important part in communication within decision making and we need to understand social influence before we can understand the use of a technology in a social setting.

3.4.6 Communication and Social Construction

Determining the effects of a technology are difficult to objectively reference from a third perspective because, for the most part, we only place value on the technology from within a social context. Fulk, Schmitz and Steinfield [1990] describe this as social influence and explain media choice as subjectively rational within a social context. Parallels between social influence, adaptive structuration, social rationality, and social

objectifications are clear. The underlying social structures in the use and analysis of technologies demonstrates a legitimising process. Where legitimacy is valence of something categorised and differentiated from a social perspective, but difference and value that are dynamic through continual reevaluation and assessment of ongoing interactions, and hence the connection to Contractor and Eisenberg's model [see Figure 6].

Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions. [Suchman, 1995: 574]

Banville proposes that legitimacy be used, as a concept, to study the social dimension of the impact of organisational information systems [1991:107]. This call to action does not seem to have been responded to within the domain of IS literature. The next cousin of the IS field, organisational research in general, does contain references to legitimacy and legitimation. Suchman splits the field into two generic approaches: Strategic, and Institutional approaches [Suchman, 1995]. The strategic approach to legitimacy research positions the organisation as a strategic entity and the public relations and representatives of the organisation gain, maintain, and repair the legitimacy of the organisation in the organisation's environment.

Strategic-legitimacy studies consequently depict legitimacy as an

operational resource that organizations extract--often competitively-- from their cultural environments and that they employ in pursuit of their goals.

[1995:576]

The institutional approach to studying legitimacy assumes not that legitimacy is a resource but that the constitutive beliefs of the environment "*interpenetrate the organisation in every respect.*" [1995:576]. To obtain a broader perspective it is necessary to visit the literature of the social sciences. Berger and Luckman in their seminal work 'The Social Construction of Reality' offer an important description of legitimation as a social phenomena.

Legitimation as a process is best described as a 'second-order' objectivation of meaning. Legitimation produces new meanings that serve to integrate the meanings already attached to disparate institutional processes. The function of legitimation is to make objectively available and subjectively plausible the 'first-order' objectivations that have been institutionalized.[Berger and Luckman, 1966:110]

Berger and Luckman also describe two dimensions of legitimacy, the horizontal and the vertical. Horizontal legitimacy refers to the social 'fit' or value attributed to an action in terms of the organisation holistically, this is a current component of legitimacy. The vertical component of legitimacy is the historical fit element, where actions are measured

against the memory of the organisation. Both the horizontal and the vertical elements have an evaluation process and a cognitive process. The evaluation consists of a subjective assessment of the social system and the cognitive process is the prediction of the effects of an action, or decision, on the social system.

Besides the two dimensions of legitimacy there are, according to Berger and Luckman, different levels of legitimation. *'Incipient'* the first level of legitimation of a human experience occurs as soon as the social system assigns a name or exchangeable symbol for it "*.. as soon as a system of linguistic objectifications of human experience is transmitted*" [1966: 112]. The second level of legitimation occurs when the social system relates the 'linguistic objectifications' with explanations of action and behaviour "*Proverbs, moral maxims and wise sayings are common on this level.*" [1966:112]. The third level of legitimation "*.. contains explicit theories by which on institutional sector is legitimated in terms of a differentiated body of knowledge.*" [1966:112]. The expertise of different functional departments within an organisation constitutes the institutionalised legitimacy of actions theoretically tied to that differentiated knowledge. The fourth level of legitimation relates regulatory and professional organisations to interpretations of the actions of individuals within the organisation, and also, the overriding cultural and legal boundaries of acceptable behaviour and responsibility that the organisation or social system is operating in: what Berger and Luckman term the 'socially constructed reality' within which the organisation operates.

Assuming that email is a legitimised activity / technology / institution also suggests that legitimate email behaviour can become a reference against which future action is measured. Email that becomes acceptable through social negotiation becomes institutionalised, and changes the social structure and the definitions of social comparisons. However, according to the social theories presented so far, the changes to communication behaviours that are likely to occur will inevitably occur over a long period of time. Attempting to obtain a more detailed vision of these changes, and further long term affects is the root stimulus of this research. However, some insights into the longitudinal nature of the change have already been posited and the literature surrounding this long term change is discussed in the following section, where we have now moved from the narrow topics of review, to the very broad.

3.4.7 Social Order Affects of Communication Technology

I have already introduced the comments by Tuman [1996] which suggests that significant change to society can be expected from ACT's. Others have also addressed these social issues at a micro level, with the concepts of Social Constructionism, Structuration, and Social Influence; however, at an organisational level the changes have be described as emancipatory;

Network-based communications allow people to bypass traditional information gate-keepers and access information sources directly. These systems ignore traditional hierarchical levels by giving equal status to

messages from all participants. Employees, through networking with others, may well be able to piece together more about the company than management would see as desirable. [Birchall and Lyons, 1995:89]

When we are faced with compelling commentaries such as these, we have to ask about the magnitude of the change we are facing. We need to check the verbiage against the figures to see if the magnitude is a drop in the bucket or whether it constitutes a new bucket entirely. Even as late as 1987 it was envisaged that until some distant juncture the capability to address 100,000 networks would be sufficient to be able to handle demand for new Internet addresses [Bradner and Mankin, 1995:3].

However; the growth of the Internet has consistently been exponential, for example the company that registers network domain names, Network Solutions, registered 2,000 names in the month of October 1994. Less than two years later Network Solutions registered 85,000 domain names in a typical month, thus outscaling the predictions of 100,000 nodes in each six week period, and shortly after, in every month. The research of the late eighties and early nineties is contextualised by being in an environment where the plateau of Internet activity was perceived to be near, where it was forecasted that it would be common for one in ten people to have access to the Internet in the distant future. This context has been continually shattered by staggering growth that continues without abate. The Internet is not growing in a linear scalar fashion, new activity, functions, virtual spaces, and new forms of business are continually being invented

leading to changes in social interaction and activity.

To begin to understand the magnitude of change that we are facing it is useful to look at the writings of Marshall McLuhan [1964, 1989] and also incorporate a historical context for the study of this new media. One of McLuhan's central ideas is the notion that a technology is a media because it extends one or more of our human senses [1964]. McLuhan passed away before electronic communication expanded into what we have today; however, he was present at the dawn of our electronic awakening and has also made some highly related comments about television and other communication technologies. McLuhan notes that our thinking about technology must change in order to understand 'electric' media. Following on from a discussion of weapons as an extension of our body in order to illustrate our changing ways of thinking McLuhan says,

Our highly literate societies are at a loss as they encounter the new structures of opinion and feeling that result from instant and global communication. They are still in the grip of "points of view" and of habits of dealing with things one at a time. Such habits are quite crippling in any electric structure of information movement, yet they could be controlled if we recognized whence they had been acquired. But literate society thinks of its artificial visual bias as a thing natural and innate. [McLuhan, 1964: 342]

On the one hand McLuhan questions the visual bias that society has developed (as

opposed to acoustic) suggesting that a different structure may be prominent in new media; however, he also suggests that electric communication is without structure, in that;

But there is a component in the automation story that is as basic as tactility to the TV image. It is the fact that, in any automatic machine, or galaxy of machines and functions, the generation and transmission of power is quite separate from the work operation that uses the power. The same is true in all servo-mechanist structures that involve feedback ... Electricity has brought a strange elasticity in this matter, much as light itself illuminates a total field and does not dictate what shall be done. The same light can make possible a multiplicity of tasks, just as with electric power. Light is a nonspecialist kind of energy or power that is identical with information and knowledge. Such is also the relation of electricity to automation, since both energy and information can be applied in a great variety of ways. [McLuhan, 1964: 350].

McLuhan's comments do indeed suggest a structural vacuum in Electric media, but if this concept is to be used in new media then a transition from analogue to digital needs to be made. It is not actually that difficult to form an analogy between the resource of electricity and of computer processing. A computer processor could be compared with a tuning device, an analogue signal could be compared to a digital record, and electric

devices {television, radio, vacuum cleaner} could easily be compared to application software {email, web browser, accounting package, anti-virus software}. Each application uses data and is constructed of data. If anything, the analogy would suggest that the structural vacuum of electricity is less *void*, because of the physicalness of the electric devices, than application software that is a *virtual* machine. If this structural vacuum exists, how it can be related to AST with its inherent reliance on the appropriations of structure is a difficult but worthwhile question.

An argument that digital media are made from discrete data, and therefore have structure, could be dismissed. Television is an analogue signal that is displayed in discrete pixels at a constant cycle, similarly, digital media is displayed in discrete units, but at a resolution and cycle that makes it perceivably analogue.

McLuhan's work was considered dubious in his own time, and while he was working on computer-based communication research he was insulated from teaching and it was thought "*better to continue working on his ideas and figure out if there was a way to properly test them.*" [Marchand, 1989: 151]. Some of the ideas that came out of this rethinking was a chart associated with different media, essentially similar to Table 2. Each chart had several words or phrases associated with each media in each corner of the rectangle.

This grid was experimental and incorporated many of McLuhan's ideas including

Table 2 [from a description in Marchand, 1989: 157]

High Definition	Sensory Closure
Structural Impact	Low Definition

Frances Bacon’s *vestigia communis*, [Marchand, 1989: 150], meaning that our human senses have a vestige of commonality, sculptors gain tactility from vision, musicians can see colour in music, and dancers can create ‘poetry’ in motion. And, my daughter when asked “what noise does a bunny rabbit make” replied “boing boing” accompanied with a hopping motion.

Sensory closure, also called *subjective completion*, relates to the separation of sensory impression with sensory effect, whilst structural impact was not wholly explained it stimulates visions of social consequence, *social objectification*, or *structuration*, being essentially an interpretation within a context. However, the terms and the chart suggest that *subjective completion* occurs at a learned perceptive level rather than at a contemplative level, where *structural impact* is most probably the link to action intentions and consequence.

To McLuhan the most resounding part of this chart is the distinction between high

definition and low definition media [1989:159]. The connection to social presence theory [Sproull and Kiesler, 1991] is strong; however, where social presence theory associates a *level* of ability to carry social 'language', McLuhans level of 'definition' is associated with the quality of the evoked image and the amount of processing required by the eye, ear, mouth, body, etc. in order to understand the intent. From this perspective, electronic mail which is considered to be a 'lean' media, or low in social presence, would also probably be considered to be 'low definition' by McLuhan and therefore require a larger amount of processing or transformation to 'find' the social information - rather than not containing the social information in the first instance. This would be consistent with the idea that electronic mail has a high degree of equivocality [Kock, 1996] as cognitive differences between individuals would create different sensory closures. However, the difference between having a low social presence and a low definition is that a low social presence infers a low emotional involvement, but a low definition infers a high emotional involvement due to the higher sensory involvement in the interpretation of the message.

The most unfortunate thing about Marshall McLuhan's work is that he passed away in 1987, too far before the brunt of personal computing and the Internet hit society. McLuhan did not show much interest in computers of the day, but had he lived on a further 15 years he may have had a lot to say. Fortunately there are many scholars and researchers who have continued this work, and there are numerous websites devoted to

this tradition including at least two²² that are dedicated to this task, and discussion forums that keep alive the McLuhan rhetoric which may very well be useful in the analysis of the results of this type of project.

3.4.8 Politics

Teledemocracy, sometimes also called cyberocracy, is generally the concept of technology mediating political process. Specifically mediation can come in the form of supporting the communication between politicians and strengthening the support provided to politicians by local government administrators [Ytterstad, Akelsen, and Svendsen, 1996]. More generally, this mediation provides not just a change in automation, but revolution and deconstruction of existing bases of power. For example the replacement of bureaucracy by cyberocracy was perceived to be an inevitable conversion of post-industrial economies into information economies [Ronfeldt, 1991] where information gains currency and traditional distributions of power are replaced, which is in line with traditional perspectives of power distributions [Barnes, 1988].

3.4.9 Techno culture, anarchy, and subversiveness.

Cyberpunk is a term that was created by Gibson [Nguyen and Alexander, 1995] in a work of fiction “Neuromancer” which elevates the virtual world to a dominant position of the core institution of corporations in a stateless world. Cyberpunks are young intelligent hackers that cyber, from Greek meaning pilot, their way around this virtual representation

²² www.mcluhanmedia.com also <http://www.mcluhan.org>

of data trying to get away with whatever they can. Glorified anarchy in a dystopian society typifies a rebellion against structure using a technologically enabled warrior. Techno culture [Galvin, 1995] is not to be discounted as an influence of perceptions of electronic communication. Although extreme from an IS perspective, discourses of this kind are contributors to societies' perceptions of virtual spaces, just as Sandra Bullocks harassment in 'The Net' contributed to some phobia of email and Internet use. Although at the fringe of attention in this research, techno culture is a concrete and available reference for behaviours and perceptions of participants.

3.4.10 Action Research

The use of '*alternative*' theories and methods to explore '*organizational, behavioural and social consequences of information systems planning, development, adoption and use*' have been '*modest*' [Lau, 1997]. Specifically, as has already been presented, Lau suggested that AR has been absent in the mainstream and secondary IS journals [1997].

Specifically, only the work of Kock [1995, 1996] was known to me, when I began this project, as reporting AR explicitly as IS research. Because I participated in part of Kock's work that was quite related to my topic of enquiry, and had access to some of the data from this research, I have included the analysis of this data in the Results section as part of the preparation for the research and determining ethnographic rigour.

3.5 Integration (Learning)

Sproull and Keisler set the agenda to study the second level effects of communication technology. Unfortunately, methods have not been used which allow for a holistic perspective on very complex interactions. We have learnt enough about the micro effects to create an intelligently informed enquiry into the meta effects; however, these enquiries have not, on the whole, been forthcoming.

Jackson [1996] criticises the Computer Based Communication Technology (CBCT) research tradition as having too much data but “*few theoretical structures from which to analyze empirical findings*”, and “*On a deeper level, technology and context are assumed to be separable ontologically: They do not constitute each other*”. Jackson reinforces Kling and my own understanding of the state of the field of research into email and other CBCT in that email has been treated superficially as *figure minus ground* or as Jackson [1996] explains it, as a mobile artifact with independence from the context within which it operates. The treatment of CBCT artifacts suggests that they exist before introduction, are introduced and would also exist if they were removed. If an organisational system that becomes something of an infrastructure can be removed completely, much like removing canvas from a painting, does this leave the organisation untouched and unaffected. Introduction does not constitute reformulation in this conceptualisation, something that adaptive structuration theory, in part, aims to describe.

The problem that is created is that the characteristics that have been studied in email research, despite the best efforts of the researchers is that;

...there is today no consensus as to what features define CBCT's. The struggle in defining CBCT's concerns generalizing or abstracting from concrete experience a set of essential of definitive elements. In other words, definitions of CBCT's are based on the features and capabilities or artifacts that come into the foreground in our experiences as users of those artifacts. Yet our experiences deceive us- no experience reflects features or capabilities inherent to technology. A technology is not a static entity; it has no necessary end state. Many technological artifacts are modifications of previous artifacts, as incremental developments add features or eliminate previous problems. ... Elements that once were considered "definitive" or "essential" prove not to be so at all. [Jackson, 1996: 235].

Even sociologists who use a much broader range of methods than IS researchers have commented about computer mediated communication study,

We need a fresh delimitation and definition of the field under study. We also must construct new analytical tools. In other words, ultimately we must choose some concepts and research materials over others ... [Nguyen, and Alexander, 1995].

3.6 Conclusion

The criticisms of the reductionist research into email and ACT's, the plethora of available commentary on how these technologies will change humankind forever, and the push for new methods of enquiry all moulded the research at its inception and at critical stages of planning.

The survey and experimental work on ACT's and the subsequent theorising provides a backdrop of theory to reflect on in the discussion section; however, the need to construct a 'fresh delimitation' became a paramount objective of the research. I was encouraged to start from scratch and create as much independence in the research as possible. It became my intention to insulate the research participants from previous academic structure and discourse and rigorously create theory grounded in practice, or more desirable was to encapsulate in my output 'knowledge' learnt from practice.

The method that I choose to undertake this research had to be low on academic control, minimal on influence but high on awareness and thinking. Creating an atmosphere of critical reflection that was not tainted by my presence or status. Ideally I needed to fit in as an organisational member and not be seen as an outsider who was then talked to differently. The next chapter elaborates on the needs of the knowledge desired and describes the method that was planned and eventuated (the two not being wholly dissimilar).

4 Research Method

The pressures of bureaucratic life, the limitations of resources, and the competitive push for career advancement consistently frustrate attempts to humanize and democratize researchers' ways of working. Community-based processes that highlight the active participation of people in formulating and controlling activities and events that affect their lives are hard to attain and difficult to maintain. Where they can be achieved, however, they provide a powerful means of accomplishing any set of social or professional goals.

[Stringer, 1996:144]

4.1 Introduction to the Research Method

The current confusion within IS research over philosophy and method makes any argument for a particular research methodology problematic. Further, the philosophical perspective of the protagonist taints the argument over the choice of philosophically

dependent methods. There are two pragmatic ways that I could argue for a particular method for this research. The first way would be to lay out all of the ways of doing research and then make a comparison in an objective fashion, a process that would be familiar with those used to positivist rhetoric. The second way is to state my biases and professional goals and then to make a declaration of my choice based on my stated presuppositions about what I was trying to achieve within my broader ideology²³. The last way is a process that a postmodernist would be comfortable with, which I am. The problem I have with trying to use a pseudo objective assessment of methods is that I consider that this process is inherently flawed, in that the reasons for using a particular method for PhD research are embedded in a great deal of exploration, learning, and revelation. An objective approach, like rational decision making, makes an assumption of full information. I did not have enough information about 'alternative' research methods as they were contentious and poorly supported in the main-stream Information Systems literature prior to my commitment to a particular method. I was influenced mainly from the synthesis works of literature rather than the reports of empirical research, the latter seeming one dimensional. I learnt more about the method I chose as I was researching and improved my use of it, but can I then strip away my learning and argue from a novice position, this would then put this method on an even footing with the opposition but it would also facade the process of doctoral research. Being *Action Research* I am in the process of *reflection* and *specifying my learning* and therefore able

²³This, perhaps, is the major pre-suppositional paradox in that the classification of AR as a philosophy negates the argument for the use of a method. For further analysis see Lau [1997] who outlines the debate over whether AR is a research strategy or a research paradigm.

to inform others honestly about the process of undertaking similar research projects in the future. If this thesis includes a description of how I chose my method rather than which method I should have used, fully informed by hindsight and conveniently weighted toward the same outcome, then it has to be a messy description. Messy in the sense that what lies beyond is descriptive of a complex rather than a simple process. The objective, then, of this messy description is to make explicit the difficult process involved in undertaking Action Research in a doctoral research project.

I will treat the methodological decision historically and describe what drew me to it, how I implemented it, and how it changed over time. I will relate the method chosen to alternative ways of doing research mainly at the point of decision, after that the comparison is artificial. However, in the discussion section of this report I will carry forth this theme and discuss other ways that research can be undertaken in this area that were not considered, for various reasons, sufficiently at the time.

The major topics in this section are a summary of the major influences of the research method construction. Although not wholly temporally sequential, I have made some attempt to describe events and inputs at process dependent stages. For example, my discussion of the influence of my supervisors is located at a stage that had significant influence about the final implementation of the method; however, my communication with my supervisors was continual and this is just a nexus of their influence.

I start off by placing an anchor on the research method, of my naivety. In AR you are explicitly reflective and trying to improve your practice, this research being my first AR project and being a Doctoral research project, the only significant research that I have undertaken, I do need to set out how little I knew before hand. The following sections then elaborate on the preparatory research and development undertaken to hone my skills as an Action Researcher before the research project was undertaken. The penultimate section deals with the final plan of action, whilst the last section describes the modifications to the research process resulting from research reflection during the project.

4.2 Prior Knowledge

In my undergraduate degree I undertook a reasonably comprehensive graduate level research methods paper. I obtained a general understanding of the scope of research methods and philosophies that were represented in the literature. The philosophies of the course were reasonably well presented, but the lecturer was more in tune with the reductionist approach and the 'other' ways were presented from this perspective. The 'other' was described in terms of the typical Burrell and Morgan [1979] framework, although 'anti-positivism' was explained as being unacceptable as a naming convention to those people who were anti-positivist.

Being inquisitive I read some works on postmodernism that were not covered in as much

detail in the course, as soon as I enrolled in my PhD. It was, after all, a philosophy doctorate and I was to make myself familiar with sufficient philosophical writings so as to inform my research. I undertook a compulsory research project in my honours year that involved interviewing decision makers in various organisations to ascertain if decision support tools were actually being used. The experience of interviewing people in industry was harrowing. I gained further experience in interviewing and interpretive analysis in consultive work and later, in a colleague's research project, which was also my first experience with action research, but I had still to take full ownership and management of a research project.

4.3 Initial Exposure to Action Research

The nature of the research I was planning from the very beginning, was to be predictive. There was evidence to suggest that traditional reductionism within a positivist philosophy alone was not going to be useful for this type of research, and as a form of affirmative action to avoid the dominance of reductionist philosophy and methods, I excluded consideration of laboratory or field experiments, and survey research at an early stage. The call for better methods to understand what has not been understood meant that I needed to find a method that would allow me to focus my research on my topic area of choice, the social effects of Electronic Mail. Quite soon after I had enrolled in my paper a colleague invited me to participate in his PhD work, and of course I did. He was using Action Research and the general principal of his method was the use of multiple action

research cycles.

In this research our team was employing a particular method to facilitate process improvement groups at an educational institution. In hindsight I could see that there was a higher level of control in the research than I would have been comfortable with had it been my research. However, in the context of my colleagues' research questions this method was appropriate as it was in relation to a typical management initiative, and he actually commented in his thesis that he believed that the level of control was low, but this was in comparison to experimental research. He also believed that having the involvement of two members of faculty as co-researchers, and having us lead discussion groups qualified as being participatory. Through my involvement in this Action Research project and through my discourse with the AR community, AR grew on me as a way of doing research, although I was exposed to other methods, AR became more appealing. The most obvious reason for the appeal was that it was a different method that had been used but had not been prominent in the IS field, and thus filled the 'new method' criteria. The second reason was that it involved real organisations, real people, an honest localised 'truth', and a *purpose of improvement*. It was value laden.

At the time I knew I wanted to use Action Research (AR) but I also did not know as much about the alternative methods of research as I probably should have. Having undertaken a comprehensive, graduate level, research methods paper, and having tutored computer based statistical methods for marketing, I had a fair appreciation for the range

of philosophy and methods available, and familiarity with sampling strategies and various ways to torture the facts from a collection of numbers. I had not been so well informed about postmodern methods for identifying and finding ‘truth’ nor what a complicated process that could be. I now know enough to say that I made an appropriate choice, even if it was mostly intuitive and only a rudimentarily supported argument to my supervisors. Luckily my colleague had almost completed his PhD using an AR method, and this supported my choice from a pragmatic perspective, or what my second supervisor would term ‘*do-ability*’. However, I knew that my research was going to have a much lower degree of control, because it was concerned with general communication rather than a predefined process of improvement, but this was not something I happened to mention to my supervisors. So partially in hindsight, and partially providing some background to my choices at the time, this section describes in detail the method I ended up using, and the alternatives that I faced.

Apart from exposure to AR through ARLIST and participation in a research project I was able to present my ideas and get some feedback on two formal occasions. The first was the 1996 New Zealand Information Systems Conference Doctoral Consortium, facilitated by Izak Benbasat, and the second was the 1997 ICIS Ernst and Young Doctoral Consortium facilitated by Philip Ein-Dor and Benn Kosynski. The ICIS event was pivotal in building my understanding of how the mainstream IS community might interpret my research and method.

4.4 ICIS and Ernst and Young Doctoral Consortium

I attended the 1997 ICIS conference and the preceding doctoral consortium at Red Top, Atlanta, Georgia. My resolve to undertake Participatory Action Research was strengthened with my discussions with my peers, specifically by how little AR was taught in the North American curriculum. In a session about ‘alternative’ research methods the panellists were adamant that it was unnecessary for the contemporary researcher to ‘strongly’ support alternative methods. I argued that the reviewers were not always sympathetic to ‘alternative’ research methods because of the predominance of a small core set of methods in research and curriculum. To support my case I asked all of the Doctoral Candidates in the room (the room was full, I would estimate that there were 40 candidates there) whether they had undertaken a research methods paper that dealt with ‘alternative’ research methods. The resulting empirical evidence suggested that only a small percentage, approximately one in forty, offered a *qualitative* methods paper as seriously as a *quantitative* paper, and my last question “*do you perceive then, that qualitative methods are less appropriate than quantitative methods*” was affirmed with a seemingly unanimous response.

Rather than weaken my resolve I was galvanised into action, to study IS in an unorthodox but useful way. My next hurdle was to convince my supervisors that AR would be useful and that the IS community needed this type of research because of the lack of effort in the teaching of such methods.

4.5 Supervision

My methodological choices for undertaking this research were negotiated at supervisory meetings, this was a dialectic process rather than a rational one. My initial suggestion for using Action Research was countered by my supervisors asking me to look very hard at the research questions I wanted answered. Although one PhD student in the department was using Action Research and some of the lecturers were sympathetic to interpretive research output, it could not be said that my supervisory team was experienced in undertaking or supervising interpretive research. Some of the dialogue we had, revolved around semantics of deciding what form research questions should take, whether indeed I was testing a hypothesis, or how I should construct the constraints and controls in the interventions. Going back to the idea of research questions, I think that these fluctuated regularly; however, the fundamental motivator for the research was to undertake research into the social aspects of electronic mail and associated technologies.

The following research methods were discussed casually or seriously in these supervision meetings and are described below along with the reasons for not taking them up as major methodological choices.

4.5.1 Survey - Hypothesis testing

I was often asked if I was just testing to see if “Media Richness” or some other theory

was an appropriate theory. I was adamant that there was more to the research than that, but having no experience with *Participatory Action Research* I was unable to explain what I would be doing in any detail. The essential reasons for not undertaking survey type research were that ACT research was reasonably new and lacked sufficient models to test, and that it was diametrically opposed to my particular philosophy of research and knowledge creation. My quest was not to test the existing theories in the first instance, but to gain an understanding of actual use in the first instance and then compare existing theories to the findings. A survey would require the construction of variables based on the literature and would inevitably have biased the results. The fresh delimitation that was espoused at the conclusion of the Prior Work chapter was instrumental in avoiding a survey approach.

4.5.2 Field Experiment

The similarities between Action Research and a field experiment were raised at one point, indeed as is shortly to be illustrated (see Table 3), much action research in IS is considered by the AR community as nothing more than a field experiment. The motivation for this question was to ascertain the need for Action Research as such and to prompt me to think of the overriding question operationalised as a field experiment. Specifically I was asked what the dependent and independent variables would be, thus generating the same objections that were manifest in connection with a survey, my objections were more epistemological than methodological. However, from a content perspective and the overarching pursuit of new knowledge in PhD research, all of the

reasons for undertaking research using validated instruments also had the misfortune of prejudicing the enquiry down well worn tracks that had already proven to result in unreliable destinations.

4.5.3 Comparative Case Studies

Using a method of comparing installations of email and analysing how the different contexts create different outcomes may have provided a better understanding of causal relationships. Case studies can also be used for longitudinal research and, therefore, could be useful for understanding the factors emergent over time. In hindsight, in depth and comparative case studies, without attempted interventions, may have yielded similar results to PAR, and the decision was swayed by the perception that AR as an umbrella term could cover a number of different research processes, and was complete in and of it's self. Whereas, in the IS literature at least, case studies were often referred to as an exploratory step in the development of theory that was then tested with rigorous methods as they were unfortunately colonised by the dialogue of positivism. However, recent advances in the dialogue of case studies as *intensive* research may have swayed me back to this approach had I undertaken the research at a later date.

4.5.4 Action Research

AR did provide the necessary fresh delimitation; however, AR is a very difficult methodology to explain to non practitioners of AR just as it is difficult to explain a seam bowl attack in cricket to a North American baseball player. Your sensitivities to

difference increase within your domain knowledge. For example trying to explain the difference between Education AR and Information Systems AR can become very confusing very quickly. IS action researchers differentiate between participatory AR (PAR) and *normal* AR, or are more likely to differentiate between varieties of non-participatory AR. Stowell, West, and Stansfield [1997] define two *modes* of study of AR in IS; *field study mode* and *consultancy mode*. Stowell et al. describe three cases that reflect these two modes, in the field study mode cases the researcher met with organisational members individually and *had an element of control* through this interaction. While the consultancy mode study is described as being foremost a consultancy that may possibly accommodate research. Both descriptions place a burden on the researcher as the owner of the research agenda, and of the research process, and would therefore be non-participatory. However, in the consulting mode the emphasis is on meeting the needs of the consulting contract and this would necessitate firstly meeting business goals and the shared ethics of the user group and the researcher may not be able to be appropriately accommodated [Stowell, West, and Stansfield, 1997] [Avison, 1997:207], questioning whether this would be AR of any kind. An even more extreme view from the Educational Action Researchers would be to consider PAR to be actual AR and consider non-participatory AR to be nothing more than a field experiment (see Table 3).

Table 3 - An attempt to describe the difference between normal descriptions of AR in education and IS research as a synthesis of the discussion on ARLIST - Spring 1998

	IS Perspective	Education / Health / Community
Non Participation	Action Research, researcher as expert, researcher driven - topic specific, field study.	Not action research, most probably a field experiment. Can also include personal, and professional development as technical AR.
Participation	Participatory Action Research, researcher driven - participant involvement, consultancy.	Contemporary Action Research - can include technical, practical, or emancipatory modes, also see table 6.

Early in my registration, and after I had participated in my colleagues research project, I began to take on board the philosophy that was implicit in the Education / Health / Community Action Research through my participation in discussion and reading the dialogue of others participating in an action research list run by Bob Dick of Southern Cross University²⁴.

²⁴ARLIST <http://www.scu.edu.au/schools/gcm/ar/arr/arlist.html>

Table 4 - Types of AR [Zuber-Skerrit, 1992: 12]

Type	Aims	Facilitator's Role	Relationship between facilitator and participants
Technical	Effectiveness / Efficiency of {educational} practice Professional development	Outside expert	Co-option (of practitioners who depend on facilitator)
Practical	As (1) above Practitioners' understanding Transformation of their consciousness	Socratic role, encouraging participation and self-reflection	Cooperation (process consultancy)
Emancipatory	As (2) above Participant's emancipation from the dictates of tradition, self-deception, coercion Their critique of bureaucratic systematisation Transformation of the organisation and of the {educational} system	Process moderator (responsibility shared equally by participants)	Collaboration

From the education AR literature we have some reasonably common categories of AR that are presented in Table 4. Bearing in mind that this 'cumulative' scale is from the education research literature and in most instances presupposes participation²⁵, I was

²⁵The researcher is referred to as a facilitator in each category but this could also be an individual in the community that has been trained through participation in a previous study or at a workshop.

trying to go beyond the Technical AR that was predominant in the IS field and into the Practical, even a little emancipatory if necessary. The most prominent features of this kind of research were that it involved the following values [From Hall, 1996: 29];

Evidence is derived from authentic data (which resonates the life experience of the researched and researcher);

Relations between researcher and research participants proceed in a democratic manner; and..

The researcher's theory-laden view is not given privilege over the participant's views.

These values were already ones that I had embraced, and they were reflected in the discussion and dialogue about action research in the education /health /community research community. I did not wish to engage in action research that was not participatory; however, this desire alone was not sufficient to rule out this variety of Information Systems Action Research.

The question I needed to answer was whether the PAR method constituted a new way of formulating the exploration of email use, whether it assisted in the creation of synthesised knowledge, and whether it did it better than AR or any other method such

as a survey approach or comparative case studies. I did not have all of the answers when I started my AR project, but AR includes a criterion of shared ethics and emergent process. I endeavoured to start the process and to modify the research as necessary when I understood more about what I was doing and had arranged a research partner. My research was fundamentally contingent on finding an organisation that was willing to participate in the research, so having a thoroughly defined process was not useful if I could not find any where to undertake it, so I simply tried to start with what I knew. In hindsight, it is probably better to start with whatever opportunity exists and using the characteristics of a reflective practitioner of AR rather than attempting to define the project too precisely.

4.6 My Rules of Engagement

With my experience participating in an AR project, with my learning from participating in an online AR course, and with the feedback that I had received from my questions to ARLIST and at the ICIS doctoral consortium I slowly developed my strategy for the type of intervention that I would undertake. I needed to obtain a research partner, and that process took far more time than I expected. In the process of finding a research partner I planned my research process, which is mapped out in Figure 7, this is what I expected to happen in the terms of AR that I had studied. I was determined that the results of the research would be truthful to the organisational environment. I therefore felt the need to adopt a consultive style that was faithful to organisational interaction and not a

supervisors, it did not of course, eventuate this way, and the actual process follows.

4.6.1 The Stages That Evolved in This Research.

The initial planned methodology was instigated at the research site; however, each stage took on meaning in the implementation within this social context. The following sub sections describe what occurred at this site and what changes to the process occurred over time.

4.6.1.1 *Design Action*

The initial contact with the client occurred at the managerial level at consultative meetings. Slowly, further contact was made with divisional or functional managers at similar meetings. The initial topic area was constructed through this consultative process and action was in the form of agenda setting and the definition of an envelope of operation. Through this process I gained an understanding of the managerial perceptions of ACT's and of their attitude toward my role. However, they gave me a great degree of latitude in terms of planned interventions with the intended user group, their instructions were not to set any firm goals or plans, but to "*go and meet with them and take it from there*".

I introduced myself to the user groups at meetings where I described the intent of the research in broad terms. I later met with individuals who were at this meeting and had informal meetings, individually and in small groups, where I started to learn more about

what they did and what their needs were with regard to my assistance. I would ask each person what they wanted me to help them with and fed back previous comments at the end to get confirmation or opposition. I attended regional Process Improvement meetings that were run by the company and that had been ongoing and I introduced myself informally, and then took a back seat. Part of the reason for taking a passive role at this stage was to wait for suggestions for action to emerge, and part of the reason was my paranoia of being asked a question I couldn't answer! Luckily this also prevented me from leading the research in adventurous, or experimental directions that could have defeated my research objectives of theory grounded in reality.

I did make suggestions when asked my opinion, and I did solicit opinions on various technologies discretely to 'test the water' but for the most part I let the group decide on my activity to help them. Unfortunately, this meant that some technologies that I would have liked to have been used by the group were never used. Subsequently, it has been useful to analyse the types of technologies that the group wanted to explore and the types that met an apathetic end.

Over time I did help to design some action; however, at the later stages of the project I believed I was in some way in tune with the process of suggesting change and the type of change that would have normally been tested by the user groups.

4.6.1.2 *Take Action*

On eight occasions I undertook training sessions on using the email system the company had been using. On some occasions I interacted with the facility technician to explore the possibility of change, and this resulted in a test to see if the option was feasible, but more often the action was taken by the user group members in the form of a change in behaviour. Frequently there was no actual change, but discussion of a possible change, and a reflection and contemplation of the current usage of the systems.

From a systems development and democracy perspective there were restrictions to some action because of the nature of the centrally controlled system. Many technical possibilities were inhibited by the need to get an administrator at a corporate site to make a change to the local system. The IT support personnel at the facility I was based at felt particularly impotent by some of these restrictions. A senior member of the team commented that he used to get industry magazines all of the time; however, he did not bother any more because he could “*hardly implement a significant change to the system even if I [he] wanted to*”. Fortunately the changes that were designed by the user groups did not require significant intervention from the corporate office.

All of the planning for the changes in this research project were derived from face to face meetings, several of which were departmental meetings, with various action outcomes, eg. where they collectively requested training to be conducted. The managerial meetings discussed above formed the initial scope of the project and provided me with entry into

the New Product Development (NPD) user group; however, changes to the system were discussed at the process improvement meetings undertaken by this group in consultation with a wider range of personnel.

4.6.1.3 *Reflection*

Attempts to get the users to construct written, diarised, feedback mostly failed. The users were mainly from engineering, design, accounting, facility management, or directly in operations and the culture of this group seemed to be very time value conscious. I did not push too far the issue of writing down reflections of change; however, I did receive verbal feedback from the training sessions, about email in general and about the training sessions themselves. More importantly this user group already had many ways of recording feedback about changes, that were ingrained in their behaviour, mainly related to process improvement and regular departmental meetings.

I did receive one to one feedback from a number of participants about each of the activities on a regular basis. An administrator and an interested manager, at another facility, fed back comments from participants of the training sessions. Two individuals in particular gave me regular updates on the *state of affairs* and I was able to obtain some specific system usage trends from the technical personnel.

4.6.1.4 *Specify Learning*

Learning was expressed at process improvement groups and on an individual basis, but

likewise, attempts to change this process within this cultural setting were apathetically received. This thesis is the major output of the specifying learning *meta*-cycle.

4.7 The Suggested Measures of Quality for this Work

The measures of quality that were suggested in Chapter 1 were constructed in relation to the PAR methodology / philosophy that I adopted. Each suggested measure is presented below with a brief comment about the purpose and the application of the measure in the methodological implementation.

1. The first measure is central to the Action Research method - Improving the process of practice.

In the conclusion of this work is it evident that I was able to improve the practice of Action Research and improve the practice of Information Systems management and development?

This measure of quality is based on a central tenet of Action Research. In defining this measure of quality I had to consider my own practice and that of the organisational participants of the research. When the reader of this work assesses this measure of quality it is important to consider the beginning and ending states of the respective actors. I believe that the most naive of the actors was myself, in that the ability to improve

professional practice was an integral part of the client organisations culture. Total quality management and other types of initiatives, coupled with an engineering professionalism, meant that the client organisation already had inertia for this type of reflection and improvement. Whether I was responsive to the needs of the participants and helped where I could, and also improved my own practice can mainly be assessed from the conclusion of chapter 5.

2. My second measure of quality is how well I have communicated the improvements in my practice for continuance and further reflection by other practitioners of Action Research and IS management and development.

Can this work be carried farther?

This measure of quality relies on the nature of Action Research cycles to be replicable. I personally will attempt to further my own research in other organisations, but rather than rely solely on my own enthusiasm for this type of research you should ask whether I have made the enquiry available to others in the manner of description and dialogue. Research projects should be able to be initiated upon reading this thesis and developing a similar set of skills. The measure of this quality lies in the availability of the text to those that would repeat this research process with a similar intent in mind.

3. The third, and last, measure of quality is related to the development of the theory

of Asynchronous Communication Technology use.

Have I been able to incorporate prior research while not prejudicing the theory development and knowledge explication from the field?

Have I been able to produce an intelligible synthesis from the multiple sources of theory and data to produce a convincing argument of both the known and unknown?

I defined grounded theory as the free expression of the participants without influence of concept or structure imposed by the researcher. When you read this thesis from the beginning you will note that there is reference to a great deal of Prior Work. However, the informing process was undertaken in accordance with the direction of Bartlett and Payne in that;

There is indeed some controversy over when is the correct time to review the literature. However, in the current authors' opinion it is necessary to perform a literature review of previously published material in the area; if this were not performed, how would the researcher know that his or her project had not already been undertaken? The skill of the grounded theorist lies in reading around the project in order to become theoretically sensitive, while at the same time phenomenologically 'bracketing' specific

theoretical knowledge while actually performing the analysis. [1997: 181].

This measure of quality is more difficult to ascertain from a descriptive aspect. To measure how well I have achieved this quality item you will have to conceptualise the product of various factors, including; the breadth of the literature review, the strategy of the intervention and the participation, and the transformation and analysis and subsequent presentation of the theory and knowledge.

4.8 Methodology Planning and Use - Conclusion

I started this research with a conceptualisation of AR that was similar to a field experiment. My proposal was approved and my supervision was progressing under the premise that I had an ability to be productive in the intervention of the company and make significant changes to the technical and operational structure in order to obtain data about the changes. My immersion in the PAR community and the development of interpretive works in the field of IS saw my emphasis change to be more sensitive to the participants in order to achieve a higher level of real world rigour in the research and the resultant data.

In summary the planned methodology and the performed process differed because of two main reasons.

1) The emphasis of the method gradually changed from moderate control and a desire to test some specific ACT technologies, to low control and the desire to minimise the bias that was imposed on the community of users.

2) What was planned and what was appropriate was not always well received. Comments by others on ARLIST, that production and engineering workers often resist formalised reflection led me to a strategy of tying the work together at the end with in-depth ethnographic style interviewing.

The activity and the organisational improvements are compiled in detail in the following chapter. Reading the following chapter will give you a context for understanding specific comments and interpretations that have been presented in the analysis, summarised in Chapter 7 and laid out in more detail in Appendix 1.

5 Organisational and Personal Outcomes

Note: The major research sponsor was Carter Holt Harvey Plastics (CHHp): however, individuals at this organisation have not been identified by their real names due to individual privacy agreements. All other incidental organisations and individuals, with whom formal privacy agreements were not drafted, have been similarly disguised. Privacy arrangements were also agreed on the grounds of intellectual property and commercial sensitivity, and specific processes, materials, and products will not be disclosed in this document sufficiently to breach these conditions.

5.1 Introduction

To say that a PhD is simply research would defeat the purpose of the qualification. A PhD is an instance of testing a person's competence to undertake independent research and to also disseminate the results of that research into the wider academic community,

in order for the researcher to pass from the student to the academy. The sole receiver of the results of this research have traditionally been academic individuals and interested parties who happen to get their hands on the thesis or individual papers published from the research. The dissemination is now also widening to an online Internet tradition; however, it is unclear at this time as to whether private individuals access online theses and whether the language used by academics makes this material readable by them.

Action research explicitly produces a wider audience for the 'results' of the research as well as formalising the process of building the 'competence' of undertaking research. The dissemination of the results still retains a significant academic basis for this process and the production of a thesis. However, the formalisation of building research competence has now been integrated into many AR theses as an explication of 'reflection' and 'learning'. I would be amiss if I did not address this learning process and the general longitudinal nature of the AR process in reporting this work. This chapter was written mostly from field notes, with the addition of recollections, and an audio journal, as a summary of the organisational and personal outcomes of this research.

5.1.1 Overview of the Research

After I enrolled in my PhD there were a number of interactions that I had with various organisations that enabled me to either refine my intervention skills for action research, collect data about email, or to do both. Significantly, I participated in a colleague's action research project and was involved in an intervention involving the groupware use

of email in an tertiary education setting.

I was also involved in a consultation project where I undertook about ten interviews within a local regional government organisation, investigating systems development and end user involvement. This experience also gave me my initial exposure to qualitative data analysis.

As an individual I grew, and it is with some trepidation that I include other aspects of my life in this thesis, but feel compelled to. Tutoring, an incipient interest in sport, and nurturing personal relationships, also helped me as a researcher as I grew in confidence and ability to relate to others. It would be easy to concentrate my reflection on purely academic 'variables'; however, in AR the researcher as an individual is a significant factor. Growing in multiple capacities enabled me to perform, be of value, and gave me a balanced perspective that was rooted in reality. My moderate success in a martial art gave me self confidence, which in turn led to a personal relationship which flourishes to this day. My ability to teach grew, as did my ability to organise myself and conduct research and interviews. I believe that this short paragraph does not do justice to the place of a balanced life in the role of an action research practitioner; however, it is sufficient to make a point, being an Action Researcher is a life path rather than a procedure.

The merits of Action Research were obvious to me but vague and inconclusive to my

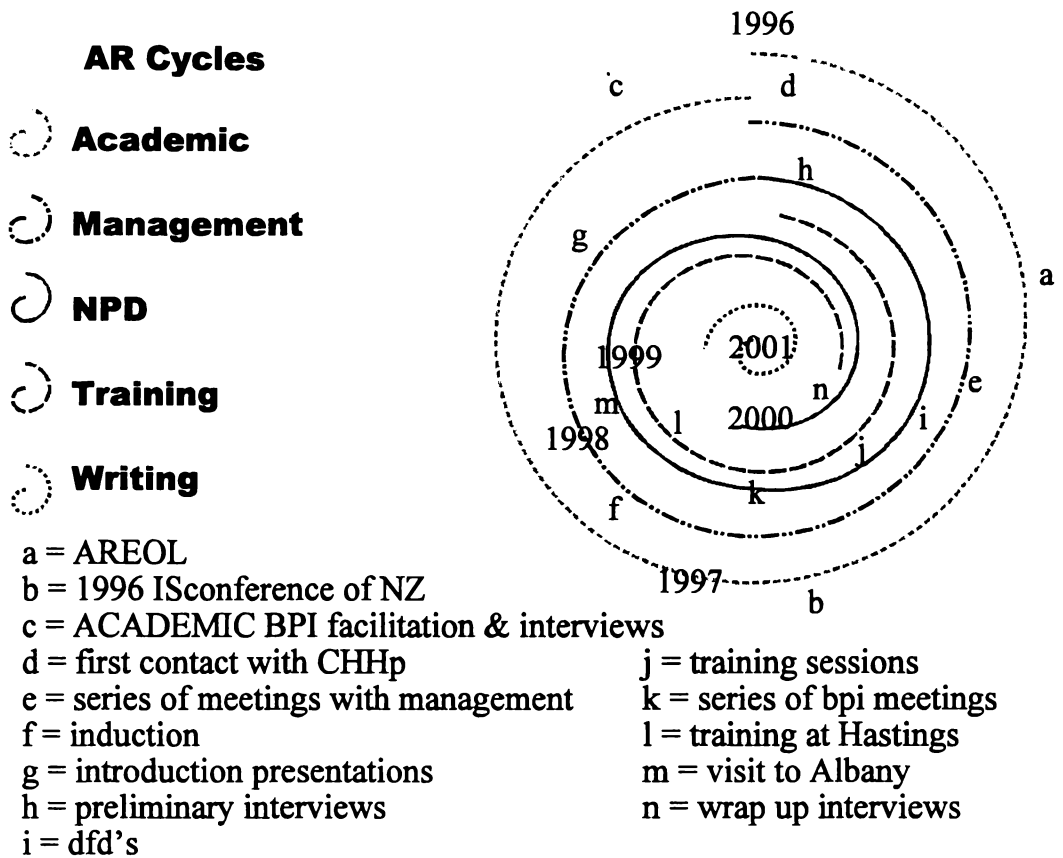


Figure 8 - The Research Cycles in detail

peers and superiors in the IS community until relatively recently [Avison, Lau, Myers, and Nielsen, 1999:95].

To describe the process, warts and all, I will use the AR Cycles presented in section 2.3.2 that outline the major stages in the research in a temporal / diagrammatic way. This diagram (Figure 8) shows the progression from one cycle to the next in some instances, Management to NPD, whilst in other instances the cycles were running mostly in

parallel, NPD and Training. These cycles are explained in terms of research and organisational activities in the following sections. A brief conclusion summarises this research in terms of organisational goals and research objectives.

Figure 8 includes a temporal indication of when the cycles were conducted and some major events that occurred in this time-line. Within each of the cycles were sub stages and the generic action research cycles predominant in any work of this type. These are described in Table 5.

<u>Major Stage</u>	<u>Minor Stage</u>	<u>AR Cycle type</u>
Preparation	Proposal	Preparation, Planning
	Recognition of Skills	Preparation
	Literature Review	Preparation
	Consulting	Preparation
	ICIS	Preparation, Planning
Prior Cycle - Academic	BPI Group Facilitation	Action
	BPI Group Interviewing	Reflection
	Transcribing	Reflection
	Co-authoring paper	Reflection
Management	Contact	Preparation
	Meeting	Planning
	Extension Meetings	Planning
	Co-option & Introductions	Action
	Induction	Action
NPD	Department Introduction	Preparation

	Preliminary Interviews	Preparation, Planning
	Group Meetings	Action, Reflection
	BPI Meetings - Hastings	Action, Reflection
	DFD's and Process tasks	Action
	System Mail	Planning, Action
	Investigation	.
	Public Folder Postings	Action (and inaction)
	Reflection on folder	Reflection
Training	Planning with Admin	Planning
	Technical Checking	Preparation
	Scheduling & promotion	Planning
	Sessions at Te Rapa	Action, Reflection
	Sessions with NPD group	Action, Reflection
	Sessions at Hastings	Action, Reflection
Interviewing & Write up	Interviewing at Te Rapa	Reflection
	Interviewing at Hastings	Reflection
	Interviewing at Albany	Reflection
	Write up	Reflection

Table 5 - Major, Minor, and AR events in the Research Project.

The most important thing to bear in mind from the preceding text, and the general introduction at the beginning of this chapter, is that I was a complete novice when I started this AR endeavour. Had I known how long it would take to learn the craft and appropriately grow academically, and personally, I probably would have chosen something easier. The following text will include instances of where I did things wrong, or where the description of a process or activity might be called into question as being

inappropriate. In the broader context of a PhD thesis this is acceptable and falls under the AR umbrella of reflection on and improvement of professional practice. An extremely difficult question would be whether an appropriate process of learning was undertaken, and whether there were better ways to learn or make the learning process more rigorous. AR Mentoring would seem to be an advantageous method to improve this learning process. I started with a mentor but moved away from the style and philosophy of this person's work. I was in communication with other Action Researchers, who had similar philosophies and styles, but mediated through a discussion list server, and these made them more remote and less available. Although my supervisors were excellent research role models and provided useful advice about procedure and appropriate process they were not Action Researchers and this posed problems later in the project. I will outline the summary of these issues at the end of this chapter, but first things first, where did it all begin in the bright and naive days of 1997.

5.2 Preparation

The first and second hurdle in starting PhD research is enrolling in the programme and gaining ethics committee approval. At the Waikato University and other New Zealand universities it is unusual to undertake course work in the actual PhD programme, but to undertake course work in conjunction with a Masters or Honours programme. Since I had undertaken suitable research methods papers and had conducted some minor research in my honours degree, I was able to apply to enrol in the PhD programme. However, to

actually enrol required the construction of a reasonably substantial proposal, and post enrollment required the formulation and approval of an ethics committee application. So even at the outset I was reasonably familiar with the literature and background of the area that I wished to study. In the initial stages I was intending to study the effect of ACT's on strategic level decision making; however, after reviewing the literature on the general understanding of the effects of ACT's and further down the track, talking with the research participants, this topic was reformulated into a more general understanding of the use of ACT's in organisations, as this did not seem to have yet been resolved.

As mentioned earlier, in an attempt to find a research partner, I sent out approximately 60 emails, 30 letters, and made about 50 telephone calls to form a contact. As a new Action Researcher this experience was an enlightening one, I had to be able to convey the purpose of the research and the benefits to the organisation that would participate, without a solid construction of what I would actually be doing. Ultimately, although I had many meaningful conversations and interactions with company executives and miscellaneous gatekeepers my research partner was eventually found through a supervisors industry contact. I suspect that I would not have been able to find an appropriate research partner without this assistance, and that is something that I will focus on, if I one day am able to supervise others through the AR experience.

Just as I established contact and attained buy-in with a likely research partner I attended a doctoral consortium affiliated with the 1997 International Conference on Information

Systems, in Atlanta Georgia. At this point I felt isolated and differentiated from the bulk of the IS community. To begin with, I was the only southern hemisphere participant except for an Australian who was then living in the U.S.A., secondly, I was proposing to use a method that most of the other candidates were not familiar with. My most vivid memory of that trip was a pre-conference seminar on Doctoral Research. A prominent academic was running the seminar and proclaimed that doctoral students should undertake theory testing experiments or surveys for their dissertations. I asked if action research would be appropriate and I was told that, 'no that would definitely be unadvisable', - I left the room.

At a panel discussion on alternative research methods, the use of Action Research was of course supported. However, it was suggested by some panellists that it would be difficult to carry out a lengthy longitudinal research project subject to the pressures of tenure and publication demands, the panellists suggested that such an AR project would best be carried out as a doctoral project. The conflict that was evident between the conceptions of appropriateness of AR as a doctoral research method led me to believe that way up South in the Antipodes²⁶ was the best place to carry out a little revolution.

5.3 Prior Cycle - Academic

A major event prior to undertaking the major part of my research was my participation

²⁶It may be suggested that treating South as 'down' is a degradation from a dominant paradigm.

in an action research iteration of a colleague within an education provider organisation [Kock, Jenkins, Wellington, 1998]. This research investigated the critical success factors of Business Process Improvement (BPI) group facilitation through groupware that comprised an electronic mail package, Novell Groupwise™ and a facilitation structure.

The research I undertook with this colleague, Nereu Kock, was formative in my selection of an area to research. I particularly wanted to study the *actual* social use and perceptions of utility of electronic mail; however, the structure that was present within Kock's research also led me to think very carefully about my use of Action Research. I became a discussion list member of an action research group ARLIST and mainly lurked, but occasionally actively participated in the discussion when it wandered into IS topics or organisational research. I became aware of differences between the use of action research in I.S. and the use within community based, education, and health research. The emancipatory nature and emergent characteristics of action research in these areas became persuasive in my final decision to use the method and to subsume the underlying philosophy. One improvement in my professional development that was concrete, but seems reasonably trivial now, was learning to touch type. Specifically, I bought a *natural* keyboard and set it up in the most ergonomic keyboard layout available (dvorak) and struggled through audio transcripts. For a PhD student in the field of IS, and for one who deals with recorded unstructured interviews, the ability to type accurately and quickly should not be discounted as trivial. On another occasion I have had the opportunity to have a university service department transcribe a collection of

interviews for a project, but in my own research I valued the opportunity to re-live the interview, and refresh my memory with the expression that was conveyed in the words and the accents, boredom and enthusiasm.

Wrapping up the collaborative research with Kock and Jenkins allowed me insight into the data analysis and academic reflection of an AR project. What surprised me at this stage was how the results were mainly generated from the quantitative and dichotomous responses rather than a rigorous analysis of the qualitative data, but on reflection this was in line with the philosophy of the research leader and connected to the Business Process Improvement (BPI) nature of the topic. It was in the process of moderating a groupware mediated BPI group, interviewing some of the participants, reading transcripts of some of the other interviews, and in informal conversation with some of the faculty about ACT's generally that I constructed my research agenda and gained insight into the method. I was passively reflecting on my actions at this stage, as I had not yet fully understood the ramifications of AR on practice.

5.4 Management Cycle - Initial Negotiations

My supervisor had undertaken some training sessions previously with the management of CHHp at a facility in the city, across town from where the University was located, and kept in contact with some of these managers. I telephoned one such manager, Nick, and subsequently we met on several occasions to ascertain each others usefulness.

What I gathered at this stage was that the company had been using email for just over a year and had recently upgraded to a corporate wide system. Nick at least felt that they had to do something more with electronic mail in order to get some value out of it and to stem some of the culture shock that they had experienced²⁷, although I was given the impression that this feeling was more pervasive.

In September 1997 I mailed a brief synopsis of my proposed research to Tim, one of the production managers that Nick had introduced me to, and he arranged another meeting with some line managers and some of his team. The best way I could phrase the synopsis was to put it in terms of what I would add to the intervention, given that the intervention would happen whether I was there or not.

What I could offer was

- 1) my time - for training and facilitation
- 2) some topic specific knowledge - about e-mail, and
- 3) a more rigorous approach to studying something that they were already interested in learning about.

I met a group of managers in October that year and had some preliminary talks about the research, and I listened carefully to what they said about email and technology. Some of the managers such as Jim were concerned that I was starting the research as they were

²⁷One facility manager was said to overtly ignore all email, much to the chagrin of his colleagues.

just phasing in an SAP implementation {an Enterprise Resource Planning (ERP) system}. I guess, right then, I was a little displeased that I was not studying this type of enterprise wide I.S. because this was a unique opportunity; however, their move into email was just as interesting and contemporary.

5.4.1 Teething Troubles

It was mentioned that they had e-mail in use for 1 year but that they recently (in the last 4 weeks) had been attached to the corporate wide e-mail system. After this broadening of their communication they had experienced some problems. The problems mainly revolved around complaints about the use of e-mail. One of these complaints was about the sheer quantity of e-mail in the system. Someone said that they felt that e-mail was stealing their time i.e. that they would read their e-mail regardless of what else was waiting and they somehow felt cheated after the fact. E-mail was said to be bypassing normal channels of communication and people were forcing themselves into other people's timetables. Specifically, they mentioned that the asynchronous nature of the e-mail was allowing people to leave messages where they were requesting people to do things before a certain date, however, people were experiencing - receiving these messages after the time or not wanting / being able to cope with the task before the given date - essentially the sender of the task was not considering when the receiver would read their mail, they assumed they would be continually attached to their machine.

They reiterated, that e-mail had not easily been incorporated into their normal procedures

for arranging time with people - it initially didn't fit with their culture and they were only partly able to articulate why. Descriptions of use were presented that they felt explained some of the problems, such as some people who were using e-mail because the facility was there and they were using all of the devices within it without any sophistication of use, in comparison to other means of communication. An example they gave me was a comparison with the telephone - they said that they wouldn't pick up the phone and tell someone they were to be in a meeting, this sort of communication was occurring with e-mail and they considered it to be negative. One could also hypothesise that people used it because there was a certain ease of use, maybe a social elitism, or necessity, a desire, or a perceived benefit.

They also mentioned one anecdote about a person in Auckland who was involved with the SAP implementation and who was in communication with other members of the SAP implementation team. They said to the other team members that they didn't want to receive any email that was FYI (for your information) (forwarded e-mail from other members of the team). They would only receive communications that were specific to them so in real terms they were telling the other members of the team not to email them anything that was not of immediate importance. This did not sound so strange except it opened up the possibility that e-mail was dysfunctional to the other team members- it was being perceived as problematic and it is notable for the reaction. I received the impression that there have been numerous token rebellious acts that might constitute actual dysfunction or simply the reaction of the group who were, essentially, forced to

use a certain communication channel without consultation.

Nick and Jim both said that e-mail communication was inevitable and they wanted to use it for “*strategic advantage*”²⁸, but they were having great teething troubles - just with the nature of people interacting with it, and interacting with each other using it. I suggested that I could create a FAQ - a newsletter that could be distributed to e-mail users, initially just to suggest some methods for communication, some things to bear in mind when they are communicating on e-mail. But also providing an address where they can send feedback about their experiences with email and suggestions for improvements. They both, after opening up the conversation to the distributed nature of their e-mail system, mentioned that their e-mail use was expanding into other areas of the business geographically and they believed this may have caused problems in the future, or perhaps create new opportunities.

5.4.2 Project Contexts

On reflection, the issue about the company implementing an enterprise wide resource planning system after only starting to get comfortable with email was not really an issue. Information systems changes occur on a regular basis in modern organisations, and if anything they place higher demands on communication systems, therefore the study of email in this environment could only benefit from these greater communication needs. The only drawback that I could see, albeit in hindsight, was that the training on email was

²⁸The actual term they used was to “leverage email for strategic advantage”, a phrase that the New Product Development Team, that I was to later work with, found very amusing.

cut short after some brief and basic sessions run by the corporate division. The reasons given for this truncation in email development was that the resources were being diverted into the newer, and larger, I.S. initiative. There were varying degrees of opinion on how much training had been offered to the staff for using email, and file management, suffice it to say that some training was offered and some staff did not attend because of other commitments.

The next meeting with divisional managers, Nick, Jim, and Murray, was a discussion of the types of projects or groups I could be involved with. The two areas were, firstly, "New Product Development" (NPD), and secondly the formation of 'Strategic Marketing Units' (SMU). The NPD process ran across multiple plants within New Zealand and a geographically wider area including plants in Australia and Chile. It appeared that the NPD process review was an initiative that had already been started that involved mainly the designers, engineers, and support staff across three facilities {Albany, Te Rapa, and Hastings} that was trying to improve the process of creating successful products from customer enquiries. It was decided that I would be better off jumping on board the NPD project rather than starting with the SMU project, which would have involved adding secondary communication channels to facilitate geographically dispersed marketing unit teams; however, this project was in the scoping stages and may not have been implemented.

5.4.3 Acceptance - A Green Flag

I was accepted into the company to participate in an ongoing initiative so that I could learn about the company and how it used email, and also so that I could input my knowledge and perspective to assist the company in a positive direction. I suggested specific research outputs at this early stage, but the feedback I received, from management, was that for the most part I should just start and we would all find out where this led us. At this point my initial expectation of having to construct a detailed intervention schedule evaporated, along with the risk of prejudicing the outcome of the project by being overly manipulative. However, I soon realised new risks, of the uncertainty of dealing with participants as directors of the research project and losing control.

To boost my confidence I reflected on the impressions that I had at these meetings, which was of being relaxed and of communicating with confident, knowledgeable professionals who were willing to learn about an emerging technology. They were results oriented, and they realised that email had potential and threat and they needed to get to grips with how it worked within the organisational system and they realised that an open agenda was the best starting point.

I eventually made a tour of the facility in January 1998 courtesy of Nick. I was instructed about general fire procedures, and about health and safety issues with regard to walking through the factory and I was issued with safety equipment.

I was shown the entire extent of the facility, from raw material through to finished product. Nick structured the walk through rationally, and I could tell that he had done this often and refined the steps needed to make a complete explanation. There was obviously a strategy to cover the entire process in sequential order, and given the choice Nick showed me the process from the perspective of the raw material being turned into products, being trimmed, being assembled or printed, and then being packed. This description was formed by the layout of the factory, so there was a pragmatic element. However, the structure of the tour was rehearsed but obviously tailored for my purposes.

We then looked into the SAP training room and then met one of the facility IT support personnel, Jeff. There were also training people, a credit union service person, and an occupational health and safety officer. I had worked in a factory constructing documentation for making doors and wood products, shortly after leaving school. The overall factory atmosphere was present and I was eminently comfortable with it, the forklifts whipping past prefab offices, the stacks of boxes and components that all had a process condition or were pressing on a supervisor's schedule were all immediately comparable and understandable. The different cohorts of workers were comparable, the tool makers comparable with joiners, the machine operators comparable with machine operators, and all of the ancillary operations were evident such as production planning and quality control.

We moved on to the injection moulding machines where they make components and

Nick gave me the rundown on what all of the machines do including the differences between the injection moulding, extrusion moulding, and the thermo-forming plant (where we had to wear lovely blue hairnets for health department regulations). The issues that were apparent became reinforced in later conversations. The staff were continually interested in the percentage of recycled material, the reduction of set-up times, the turnaround of new product development, and other time dependent and efficiency dependent objectives. There was also an industrial and manufacturing sub-culture partially evident in the personalisation of working space where allowable and in the use of language of those workers that I met on the floor, which was tinged with a little maverick and mischief.

We went through the tool shop, Nick said that this was the largest tool shop (of it's kind?) in Australasia. We had a look in on the storage area for finished products, Nick said that they have far too much stock. We also looked in on the development of some new products, which were commercially sensitive, and I was reminded of the privacy agreement that I signed each time I visited the facility, this also doubled as a stick on name badge. It was important to note that the privacy agreement specifically mentioned commercially sensitive products or processes, but nothing about reporting about the use and perceptions of email or other ACT's.

I had lunch with Nick and he told me that we lapsed with our safety conduct in that we were not wearing safety shoes, he was very serious about sticking to the standard safety

procedures and issued me with a voucher to pick up a pair of steel capped shoes as soon as I could. I was informed of the special evacuation procedures that were needed because of the neighbouring chemical facility and of various other procedures and rules. The way that Nick was running through these procedures and rules was suspiciously fabricated, but my suspicion was immediately answered when he handed me an induction booklet and informed me that I had now been inducted into the company! I was told that any person that had a need to make regular visits to the facility had to go through this process, which was a slightly abbreviated version of a full induction, but it immediately made me feel like a connected part of the company.

5.4.4 Connections

I met with Jeremy and Jeff in the information technology support group. On site even Jeremy who is the manager of information technology did not have the privileges to do the administration on a large part of their information system. Most of the applications were run corporate wide, including the e-mail system, and were administered remotely. Nobody on site had access to the e-mail server directly, they could not create or modify accounts or e-mail groups. Jeremy joked that he did not bother getting the trade journals any more because he could not do anything with any idea he got - he seemed a bit peeved at this. I imagined that the computer support crew would have dedicated a large part of their jobs on proprietary stand alone systems that they could do things with, such as those to do with the customer support - order tracking, scheduling, and the production CAD/CAM systems, these they were most willing to talk about. They reluctantly looked

after the systems where they had one hand tied behind their backs. The lack of autonomy would likely only get worse with the impending rollout of SAP.

The lack of privileges on site was linked to a corporate wide five-year software freeze that started a year before I started my research and shortly after they installed Microsoft Office 95™. The corporate ideal was to get compatibility up between divisions even if it meant that local customisation was minimised.

CHH staff had external e-mail but this all went through a single gateway in Auckland and could on occasion take a long time or sometimes it could fail completely because the corporate technicians could decide there was too much on the queue and clear it. File size was also restricted on this gateway to 1mb, later in the research project I was informed that they had substantially improved this bottleneck. However, when I started this project some of the design users were connecting via a local Internet Service Provider (ISP), using a modem, to send large drawing files to customers and sub-contractors. They used a pop3 Microsoft Exchange server, with Outlook clients throughout the corporation.

SAP did have an email component but it was process oriented and mainly used for validation and approval not for free form communication. However, they had the ability to create forms (called e-forms) whether these could have been used for group discussion or not was debatable. The uncertainty surrounding this issue and the lack of tangible systems to experiment with meant that this technology cluster was not explored.

They had a shared file “*public folders*”, where they could put content specific documents. Jeff, Jeremy, and Jane had administrative privileges over the public folders server so that they could create new folders and change the read/write privileges of individuals and groups. If there were multiple sites involved in a discussion then file replication became an issue with the folder system. The common folders needed to be set up at each facility, and a duplication time period needed to be used which was acceptable from a traffic perspective, but that did not affect the discussion because of a too-long time lag. They received no documentation for the email client or server administration and these technical aspects seemed to be a low priority for both the technicians to investigate, or later, for the participants to be interested in.

Having investigated a collection of technical aspects, and having met a large number of workers throughout the facility, I then set about establishing contact with the user group I had been directed to, or alternatively that which had been co-opted into working with me. A manager associated with the area, that I had already met and had preliminary discussions with, had requested an abstract of my research and role. I constructed a preliminary outline of my research and emailed it for distribution to the staff in the area.

>----- Original Message -----

> From: Robert WELLINGTON [SMTP:rjwgtm@mngt.waikato.ac.nz]
> Sent: Wednesday, 15 April 1998 12:12
> To: <tim>@chh.co.nz
> Subject: Outline of the research project
>
> <tim>

> Here is a draft summary for your meeting on the 21st.

>

> Outline of Research Project for NPD Process Improvement

>

>

> This research project is about the organisational use of electronic
> mail. The focus of the research is the impact of electronic mail use
> on strategic/tactical decision making and the information and opinion
> exchanges surrounding organisational change. This research project
> employs an Action Research approach. This approach allows the
> organisational participants and the researcher to work toward
> organisational goals.

>

> At this stage of the research project an intervention will take place
> within the new product development process. A cross functional group
> of CHH employees will redesign the NPD process and will, at the same
> time, concern itself with how it communicates together and with the
> rest of the CHH Plastics organisation with regard to making these
> changes. The aim of the researcher is to assist group learning about
> their change processes and to bring tools and mechanisms to the group
> so that they can make the best use of their and everybody else's time.

>

> It is envisaged that the outcomes of the research project include
> tangible process benefits to the NPD process and also less tangible
> benefits to the process improvement team members and other
> participants. Systematic reflection and learning techniques can assist
> the team members in this and future projects and these will be
> promoted by the researcher. It is also hoped that trade and academic
> publications will come out of this research project, and that these
> will be coauthored between the researcher and the CHH staff.

>

> Is this too brief <tim>?

>

> Robert

Once I had the go ahead I immediately felt less like a university researcher and more like a participant collaborating in a learning process. At this early stage the organisational managers had not directed the research to a specific topic of enquiry with which they were concerned, but had directed me to a broader organisational group that may have need of better communication practices. However, dialectically the managers had persuaded me not to define the research topic before I met the user group, they had diffused the direction rather than focussed it. It was up to this group to determine the course of action from this point, until the research started a different cycle.

Although I felt that I had not actually done anything, in Action Research terms I had already been through several cycles of research. The first cycle was related to the research that I had participated in with Kock, here I had ascertained the style of inquiry that was used and set about changing it to be more responsive to be in alignment with a different research philosophy and a general communication topic rather than a management initiative. The second cycle was the activity of establishing a rapport with prospective research participants, defining research areas, and expanding the scope of the research to other groups. I was now actively, or at least potentially able to start, researching in the organisation creating change.

5.5 NPD - Starting the Project

I next met with the manager, Tim, who had been working with the New Product

Development (NPD) team. I was eager to learn what I could. Tim outlined some of the major characteristics of the NPD process, the significant points being that the company had NPD projects numbering in the hundred that were being processed at any one time. These projects could be an alteration to an existing product right through to a new product for a new customer.

To add a context, CHHp make plastic things. Simplistically, things can be expanded into components and containers. A component could be for an electrical switch, a rifle, or, more commonly, the handpiece for a dredging gun or a chamber within a milking machine. Containers range from milk bottles, soft drink bottles, margarine containers, and sandwich containers through to large industrial drums and storm water conduit. Some of the facilities produce for local demand, i.e. the Hastings facility has a large production of horticulture packing materials for the local export fruit industry.

5.5.1 Geographically Distributed Process

There had been a drive to consolidate the process of product development across all facilities, as historically the process was undertaken at each site and it did not develop uniformly. The first part of that drive was to relocate all of the tool-makers and a number of designers to the Te Rapa facility. The NPD manager was able to get his own budget, before that he had no resources to develop business nationally - he "*kind of had to borrow people and resources piecemeal*". At Te Rapa they had centralised 10 design staff in the design room and 25 engineers and tool makers in the tool room. They also

had a consistent tie-in with the manufacturing plant to test the new product tools for most of the products they designed. They obviously wanted to use this resource in the most profitable areas. They wanted to offer the fastest response for new product design where it made a difference, and they wanted to be champions of innovation. Although how much of this dialogue was management rhetoric and how much was a shared ideal was unknown at this early stage.

They also felt the need for a screening system to discourage the wasting of resources on what they called “*dogs*”²⁹. To this end they wanted a rough costing system which attempted to promote winners, although this was not a simple heuristic. Expertise was needed throughout the process, sales and market expertise to evaluate the potential of the customers' product - is the customer going to sell as many of these things as they think they will sell. Technical expertise to determine if, as a product, it is feasible and whether it would be easy or problematic to design or produce.

Most of the engineering and management team members remained at their own facility, but remained significantly important to the design process because of their knowledge of existing products and of past experiments and problems. The task that the NPD project team had was to devise a method to fully consolidate the NPD system across all facilities. They needed to have the system transparent to all team members regardless of location and to provide better management tools for the selection and filtering of new projects and for the scoring of all projects against the companies key performance

²⁹Products that they developed for clients that did not turn into profitable lines.

indicators (KPI's) .

My task was to help them with the system design with what I thought to be very limited expertise, but what they perceived to be an important independent and unbiased perspective. My research goal was to stimulate the use of ACT's during this development period, observe the use of electronic communications and record perceptions of efficacy of this technology. For the most part this would not be the physical recording of actual messages except when they related to something I specifically had initiated or which related to comments made by individuals. The number of messages that would pass during my research period would most probably be extraordinarily massive and gross analysis would be very difficult for describing electronic communication use and would not be supportive in understanding the perceptions of efficacy mentioned above.

My activity, then, was to participate in the process improvement group for NPD while taking notes and conducting informal interviews throughout the period of my involvement with the company. I also participated in any other activity that was negotiated with the group that was involved.

5.5.2 Improving Data Collection and Communication

I made a presentation to the members of the NPD team, which included; managers, engineers, and designers. I also made the same presentation to operations staff, account

managers, and administrative staff. I introduced myself and described what I knew so far, and what I was intending to do and how I would do it. I received constructive feedback during these meetings, but much to my later annoyance I did not record any of these comments in sufficient detail for them to be useful. From this point I started to refine my note taking methods, which may seem to others a trifle messy but seemed to work for me, and I also started to make audio recordings. Rather than start to record actual meetings, which may have tainted my consultative style at this early stage, instead I would finish the meeting or interview and then pop around into the car park and review the meeting verbally. This was a strategy that I adopted from a suggestion made on ARLIST, that I found useful and provided reasonably detailed outlines of what had been said without interfering with the interaction in the meeting.

The product development process was a good place to start, they said that they had been working on it for some time but it was mentioned by several people that the process was stalled. One of the support managers, Paul, pointed out that they had been working on the NPD (new product development) process and had constructed a system using Microsoft Project™ and Access™ to track the projects, the management of the NPD was to come out of the information that was provided from such a system, yet nothing seemed to have been formulated yet.

I sat down with Paul and went through the system he had help construct. Some of it was legacy Microsoft Access 2.0™ that someone else had constructed and the remainder was

from the Office 97™ suite, which was installed in spite of the continuing corporate wide software upgrade freeze. The Product Development Review was a report that he sent to the other facilities weekly, and to their own production, sales, and quality departments. At that time Paul sent a hard copy of this report even though the system was more or less interactive. He would have preferred if people could have accessed the live data, but that posed too many technical problems. The Access databases were shared all over the facility, but they had problems because there were sharing problems and slowdowns or crashes caused by multiple users. Other reports that Paul produced were to do with resource allocation, tool testing, and C.A.O.S. (a rather unfortunate acronym for Customer Approval of Samples). This cohort of employees seemed to be primarily interested in the communication of process information for non-routine events. Opinions were considered important to obtain when needed, but not to communicate without being a response to a specific enquiry.

Paul said that the Product Development process was not well documented, they had a ISO9001 process flow chart in Hastings which was supposedly thorough and accurate, but it was also incomprehensible because of the way it was written - it had no utility to the production managers or designers, hence they called it 'the dead sea scrolls'. In the push to get ISO9001 this process had been documented, but it needed to be re-documented so that it was followed, it meant something, and it was relevant independent of the site location (Hamilton, Hastings, Australia).

The issues this department were facing were characteristic of a geographically dispersed organisation with multiple interdependent processes, legacy systems, incompatible technologies, and poor communication. Although I was there to learn about the communication use, and there was plenty of scope for this research in this particular context, I was also able to make myself useful and provide some basic systems analysis. Paul needed to figure out how to take the dead sea scrolls and produce a top down type of flow chart. His intention was to split it so that there were major phases and within each phase there are steps to be conducted, much like a linear indented list. When they had redesigned this process their initial intention was to “*go with it*”, detail it and construct e-forms to carry out the process within SAP.

I later confirmed the process that was described by Paul by talking to the manager of the NPD team who also reiterated the importance of evaluating the individual projects and pointed out why it was a tricky business. He said that generally a customer will know how much they will sell, but there were exceptions. If the customer was known and had been in the business a while then you could pretty well take it as a good estimate; however, the expertise of the sales and marketing people was essential in some cases and advisable in all.

As far as getting input from other people was concerned Paul said he would have to be careful because he did not want the process to stall. As a last step they would have to get all of the top divisional managers or representatives to “*sign off on it*”. I was faced with

a similar statement in a later part of the research, when two engineers were adamant that they did not need the input of sales representatives to build a system that they would have to use. They also responded to my question "*have you built anything for them in the past? Did they use it?*" with "*yeah,... no, ... they're useless*". From a moral and IS professional perspective this lack of communication and the evident loss in system functionality that resulted from it, was a stimulus to try and encourage interdisciplinary communication whenever the thought was entertained by the participants.

I met with Jeff in the I.T. area again and he had some firm views about some of the end-user development that was being undertaken at CHHp "*People [users] shouldn't be allowed to construct databases that other people need to use*". Jeff relaxed this statement by saying that it was alright if "*they have the ability to do so*"; however, Jeff didn't think that anyone at the facility did have the necessary skills.

5.5.3 Distance is Important

Tim said that they were tendering with an Australian company to become the sole supplier. This customer saw their expertise as an important asset. It was important to this customer that this expertise was available on-line. Video conferencing was one option. Tim asked if perhaps there were other technologies that they could use. I explained some ACT options, but I did not follow up this opportunity in a proactive manner. I believe that Glenn commented about their relationship with this client in a recorded interview later in the research. They had used face to face communication to create a relationship,

but were maintaining this relationship well using email. Relationships were also maintained with subcontractors and suppliers in Australia and Singapore using email.

On the issue of changing the NPD process Tim said that there would be inputs from different departments and that buy-in would not be a problem. This was a different message than I had received earlier and I was looking forward to how I might assist in this communication.

5.6 Needed Interventions

Several individuals had suggested that the one thing I could do that would be of immediate assistance would be to run training sessions. I told Tim that I would construct a tutorial for the use of e-mail. I would also end up investigating the communication options within CHHp, with regard to increasing discussion, to help in getting feedback about the proposed NPD system. We also talked about putting the flow chart material in a public folder and having a discussion about it with threads for each phase. I discussed the technical aspects of moderating a discussion on a public folder with Jeff, but a moderated list as such seemed not to be needed in this environment, where everyone had the right to send anyone else a message, and where interaction was already socially moderated.

The action for the first two interventions were planned through conversational

communication with individuals and at meetings with a cross section of the employees. I would run tutorials, and I would facilitate a discussion through the use of the public folders.

I installed a version of the email package that they used within CHHp on my computer at the university and devised a presentation pitched at an intermediate level. I arranged training sessions at Te Rapa for the NPD group for March, other sessions for office and operations staff would start before then.

I next interviewed a manager, Glenn, who could tell me about the toolroom, as this seemed to be an important part in the NPD system, and from my perspective and important link in the communication between the designers and the operations personnel.

5.6.1 The Tool Room as an Island

Glenn was thinking about the tool room as a resource that was potentially independent of the CHH Plastics facility. Although the local design team are the major responsibility to Glenn, he saw the facility as being able to service a plethora of businesses within the CHH group and beyond. The tool making facilities were a major investment and Glenn wanted to see it utilised to the maximum of its potential. He commented that the tool makers could make anything, and you should not limit them to die heads, they could be involved; in maintenance projects, engineering projects, and prototyping, and they could do it competitively. Other industries could be customers for their special talents and

equipment. It was important to note that this manager was striving for autonomy for his business unit, and acted as a conduit for much of the electronic communication that was received, except for the independent discussion list access of a couple of his staff. He preferred for his staff to walk up a set of stair and see the designers face to face rather than send an email. The technical capability of the email system to connect all individuals autonomously was not matched with the socialised pattern of communication in this department. Specifically, the manager of the tool room explicitly expressed a policy that the toolmakers would not email the design staff, but would have to track them down physically to sort out problems or to interpret drawings. The fact that most of the design staff worked immediately above the tool room contributed to this policy; however, some of the design staff were not always at their workstation, or available. An asynchronous method of communicating in the first instance may have been a rational choice for the toolmakers, but they were expressly made to attempt face to face communication.

Glenn preferred not to issue quotations on new work unless all the info was in front of him, which was an interdepartmental process. Often the quotes were inaccurate because he suggested the sales people gave him the wrong information. All of these interactions involved communication issues, and the ability of the individuals to do their jobs quickly and accurately revolved around the speed and accuracy of the communication methods. Some of these issues were purely technical, in so far as developing a technical ability to transfer a large file; however, some of these issues were socio-technical, eg.

communication between suppliers, customers, salespeople.

Glenn said that it would be good to have an integrated system for projects, so that you could tell the sales people how much they cost the company on a particular product. Glenn's answer to the poor communication process was to systemise it and then blame the salespeople for inaccuracies. The general mentality of turning all of the communication relationships into structured systems was a repeatable theme in the course of this research. Although the process that they dealt with was quite complex and in some ways unstructured, the *engineering approach* was to document it and improve it incrementally.

Also, Glenn mentioned that he thought that they needed a tutorial for e-mail use, and I confirmed that I would be running one. He went on to explain that they have a lack of understanding about these sorts of technologies. He said that he and James put in the CAD CAM system and that they had suffered all sorts of problems and setbacks in this process because of issues that they did not know existed.

Specific problems that Glenn had with technology was trying to integrate different versions of projects (different software versions), and lack of knowledge about connecting systems together. Glenn also commented on how much time there is at the front end of the product development process, he knows that they could do something with email but he says " *If someone came in tomorrow and said that this (electronic*

communication) is the greatest thing since sliced bread I wouldn't know the difference" meaning that he has a lack of knowledge about communication options. My ability to spend some time on the issues of communication technology was one of the reasons I was being well received by these people, I was able to dig deeper, or rely on what I already knew to offer them alternatives. Relying on my academic knowledge made me reflect consciously on my contribution and intervention.

Glenn placed the data transfer problems they have with the CAD/CAM system into the general technology cluster of communication technologies. They have a connection between the system that is used for designing the tool (a large piece of metal that is machined to manufacture the finished shape of the product) and the machine that automatically "cuts" the tool. The cutting process uses "cutter paths" these are the collection of circuits that the machine head travels when it is cutting through the metal to make the finished tool. In the past they have had problems getting the very expensive machining tool running at full speed because of the delays in the communication between the design workstation and the client computer workstation that runs the machine. Glenn and Norm sorted out most of the problems through involvement in Internet discussion lists and newsgroups. This expanded technology cluster that covered: industrial computing, machine communication, asynchronous communication, synchronous, communication, Internet, and intranet, was the largest conceptualisation of communication technologies that any of the participants had. Most of the other participants had a reduced conception of ACT's and some did not relate the public folder

system as a communication technology, but as a filing system. A significant and common concept was that asynchronous communication technologies can be perceived of as being “*real time*”, and therefore being synchronous communication technologies. Some explanations of historical events would suggest that email specifically was *relied* on to be synchronous on many occasions.

5.6.2 Technical Problems

Several meetings with Jeff (IT support) obtained some perceptions about email use, from a technical and a historical perspective:

5.6.2.1 *Three line memos sent as word attachments.*

The receiver has to wait for Word to open just so they can see three lines of text. The design staff who use the UNIX based workstations never read this as they can only run WinWord™ through a very slow Windows emulator, although they could read a text email message quickly. Although there have been developments in compatibility and support for proprietary file formats in Unix some of the complaints about this phenomenon came from individuals who used desktop PC's, and their complaint was similar, in that they just did not want to open up a word processor simply to read a short message.

5.6.2.2 *Excel spreadsheets cut and pasted into email.*

Some people send a worksheet as an attachment, or maybe just a graph, however, they

don't just send the immediate data, they unknowingly send the whole workbook file, which could contain sensitive information. The technical staff highlighted the problems with a GUI email system and the potential for embedding sensitive information, or simply making the email messages too large.

5.6.2.3 *Contacts Manager is under-utilised*

Some people wanted to use the calendar for arranging and confirming meetings, but some of the staff do not use these facilities causing problems. The use of the calendar poses a classical 'critical mass' case study. More than half of the staff use the calendaring but a small number of staff will not, and when asked, their comments would suggest that they would not switch over to using the calendaring in the email system, but rather use a personal organiser or a bound diary. One individual mentioned that they had people working there that would not answer the phone, and they related this behaviour to people that avoided participation in the email system.

5.6.2.4 *Public folders are under-utilised*

From a technical perspective the company network resources at the beginning of the research had capacity and potential that was not being utilised. The constraints on the local system administration made changing certain things difficult, whilst those things that they can change they wanted to promote as being useful. The public folders were one area that they could do something about, and as it happened this was the area that where the largest growth occurred during my involvement with the company.

5.6.2.5 *Public groups are under-utilised and misused*

Emailing to multiple people and having experienced internal mass mailings that were ill targeted. Some people who used non-Outlook™ mail readers, ie. the designers, using SGI™ workstations had difficulty with these public groups, in that their mail reader displayed up to fifty lines of email addresses that they had to scroll through, followed by some inane message “*would the person owning the blue car please move it....*”. However, finding addresses was difficult due to the size of the global address list (1500-2500 growing to potentially 3500). Most of the addresses that are listed will never be accessed as they are for employees of quite different business units. A different employee made a similar comment about the visibility of public folders that could not be accessed. The visibility of unaccessible information or communication resources was both intriguing and frustrating to the staff. On the one hand it made searching for accessible information or addresses difficult, and on the other hand it made the structure of the corporate information resource partially transparent, allowing for a picture to build about projects, responsibilities, resources, and growth of the different corporate entities.

5.6.2.6 *Business Use*

Personal email use was frowned upon and so was sending files of excessive size. The main reason for this was that there was a bottleneck at the head office where they only had a pair of 64k modem to connect the entire CHH Wide Area Network (WAN) to the outside world. Jeff believed that CHH needed to seriously upgrade their connection, and through the course of the research there were reports that capacity had slowly increased.

5.6.3 Email Tutorials

I contacted Janet, who was an administrator, in order to book training rooms and arrange for staff attendance. Janet handled the booking and also provided me with some comments that she had received after each session. It was about this time that I realised that the original project sponsor had retired, and returned very infrequently to consult on special projects. I also realised that at this stage it did not matter that there was no actual authority at the facility that I could fall back on. I had made so many contacts and had so many referrals that I could now arrange meetings with just about any member of staff without fear of causing any problems. One of the strengths of Action Research is this cycling out from one project to another. The training sessions especially had allowed me to meet a more varied cross section of staff than I had been exposed to in the business and operations meetings that I had been involved with to that point.

I started email tutorials on 23 February 1998 and it seemed to go very well. I tried to pitch the classes to those people who would have already been using email who could send and receive messages, but who did not know much about some of the background features, such as the public folders resource and creating rules for automatic filtering and performing routine tasks. One participant wanted to know more about the notify feature and others about rules. For the participants that had wanted a technical fix I directed the requests to the administrators. Feedback during the session had allowed me to improve my presentation and begin building a picture of email use.

I conducted a second session for general staff and a third session specifically for the NPD group. I also conducted a follow up session at a later time at this facility and a further four training sessions at a more distant facility.

5.6.4 Data Flow Diagrams

After consultation with one of the main facilitators of the NPD process I started to assist in documenting the process. Initially we used Post-it notes and pencil to construct a flow chart of the existing system. Paul said he needed direction and in the past had thought of breaking down the model into phases. They had previously got a consultant to assist with the documenting process in order to obtain an accreditation for ISO 9001; however as mentioned previously, they now referred to these documents as “The dead sea scrolls”. Although Paul wanted direction I was reluctant to enforce an IS solution on him but instead to go along with him and offer suggestions of methods etc. as he needed them. Initially, I suggested that we draw columns and rows on our large sheet of paper representing the different entities vertically and the different phases horizontally. This construction would allow us to see the extent of communication and also to see the extent of linearity in the process. On reflection allowing the visibility of communication channels was manipulative, in that it may have increased communication about and development of ACT’s. Although, I did not feel too negative about this manipulation as the user group had espoused the investigation and exploration of communication technologies, but it did feel a little sneaky.

I also spoke with one of the technical administrators, Jane, about the private groups facility on the Outlook™ clients. It appeared that this was not setup by default. This could have proven useful, along with Public folders and Public groups. I asked Jeff and Jane to keep track of the installation of all three of these things to find out if there were an increasing number of people requesting these features. Later I was to find that there was a surge in installation of private groups, but mostly the surge came from the increase in public folder use. Whereas the Public groups were administered by the corporate officers and did not get used much for local purposes.

I discussed with Paul, the flow charting process and where he got after I helped him. He took the flow chart that we constructed together down to Hastings. With the people there they constructed the same thing as they saw it - they put the dead sea scrolls into the same form. They then wrote the activities down and the gatekeeping steps (Paul thought that they had just taken these from the scrolls and not rationalised them at all. - he said something like 'the cheeky buggers' when he realised what they had done.). They were then going to get Paul, Glenn, Tim, and Trevor (from Hastings) together and see if this process represented 'best practice', with the intention of implementing it. I was sceptical because I could see that the process documentation was sketchy, there was more discussion on the process to be undertaken that I was hoping could be facilitated using ACT's.

5.6.5 The Duality of Purpose - Continued Supervision

On various occasions my supervisors presented me with, what can only be called a ‘Time Out’. At one point I was asked to document external influences, extranormal operation of the company. This would simply mean that if I was to grow as an ethnographer, I needed to be able to find evidence, or a trail of cause, in a variety of sources. The interesting thing about CHHp is that it is a plastics company owned by a corporate that has core competencies in timber and wood pulp³⁰. I was told by the employees that the only reason they were not divested was that they were quite profitable. However, I often found that perceptions of the employees at CHHp suggested that the corporate wide systems and intranet system did not suit the business processes and activities of CHHp as well as they could if they were separate.

My supervisors also suggested that I look at starting a new cycle with a different client. Several companies were suggested, one supervisor thought that I needed to get a second client underway quickly while the other considered that this one case that I was already involved in would have enough data to substantiate a PhD, and, more importantly, as an Action Researcher I had a moral / ethical responsibility to provide quality research to the research partner I already had an affiliation with. So, at that stage it was agreed that a single organisation with multiple facilities would be appropriate, on balance, for these combined reasons.

³⁰After my project had finished this division was divested to an international concern.

I was also given a collection of questions to answer with regard to my research project to determine the boundaries and questions that I had, and these were my answers, half way through the research process.

What do I see?

I try to see everything, I guess a more useful question is what do I ignore? I don't worry about normal day-to-day operation, I leave that as a background hum. I do take it in, but only as a familiarisation thing, not at the same level as that which is exceptional. Exceptional things are those things that don't occur everyday, at CHH or at 'other' institutions. Certain things you accept as being normal activity, I don't document how many copies of a form are produced and who they go to, I don't worry about how often they take breaks, what colour their soap is, or what direction they drive around in their forklifts. To a large extent I have no interest in what they make, or how they do it. I am interested in changes in the way they do things, and to find these changes I don't have to intimately know their existing system, I can rely on them to tell me what is different and why.

I try to see change, I smell difference. I try to persuade people to tell me these things and to reflect on them themselves. I don't think that this will confuse the analysis, this is a normal part of action research. Just because people are more aware of what they are doing and how it may impact on the organisation doesn't mean that I am confounding the data. One of my supervisors asked how I would factor out this new awareness of how things are done. The answer of course is that you don't. The replication of the action

research knowledge is through application. You carry out a similar project in a new setting and transfer the knowledge that you have already constructed while enriching it. You don't factor out deep reflection, because that is the nature of action research. Saying that this is a fault is like saying that questionnaire research is faulty because it leaves the population you sampled with no immediate benefit - it is the nature of the method and an ontological problem.

What do I ask?

I started off asking very simple questions, I wanted to gain familiarity with the people, the manufacturing process, and the culture. I ask questions of people which dig into how things are done. The way that decisions are formulated - specifically who is involved at what stages and the outcomes of these methods. For example I might ask how this process was changed before, the description of the process may not involve a particular actor within the process and I ask 'how did they feel about this process?'. Of course I should go to that actor and verify this, or gain new understanding if it doesn't add up.

What will I ask?

I am going to have to steer toward asking about social acceptance. I will have to talk to people whom are impacted by decisions and behaviour and see what they think, both those who were involved and those that were not. I will have to talk to a broader array of workers.

What do I avoid?

In hind-sight this question is what I answered in What do I see? It is easier to avoid things than to see them, therefore you know what you don't know but you don't know what you know. I am beginning to gain a pretty good understanding of the things that I am avoiding. I try to avoid stepping on toes, I won't get the computer support people to do anything unless it is common practice i.e. getting personal address books initiated, or adding public groups.

What do I separate?

I try to separate what would have happened with what might happen (as soon as some distinguishable intervention has been implemented). I ask questions about 'is this what you would normally do?' I try to get people to reflect on common practice. I have been asked to a certain extent to separate assistance from research, but this is one of the things I avoid. Kevin and Dave both indicated that they wanted to see a positive input from me - they weren't willing to waste their time with research that wasn't going to help them. The e-mail tutorials were an attempt to provide some visible benefit, and they went down really well, which is something I can build on. The actual interventions won't be so easy to separate benefit from manipulation on an individual level, but they are appeased at present.

What do I associate?

This is a difficult question as I have not yet begun to have things coalesce in my brain

or on paper.

Who do I involve?

I involve anyone that is interested, or anyone who should be affected by the intervention, or series of interventions. I will endeavour to make the discussions as open as possible as this is my feeling of what will become of the medium. This is a personal value thing which will easily be subordinated by any directive to do otherwise. Closed discussion may be necessary for security reasons, especially when it comes to actual new product development details. Discussing the changes that should be made has the potential to be more open than it has been purely from a logistics argument.

Who am I missing?

At the moment I am missing representation by the sales people and by the operations people. Some of that can wait until individual intervention but I should go and talk to one Accounts Manager before things go to far and ask them how things used to be done.

What is emerging?

There is an interest in creating public discussions using the tools that I have shown them, the ones they already have. I now need to formulate how to add some rigour to the emerging changes.

Where am I?

I believe that I am at the beginning of the change. That I have sufficient background to talk to them intelligently and I have interacted with them enough so that I am part of the furniture. I have gained a partial set of 'benchmark' figures or representations, with which to measure change. People may not be able to quantify a social state for me to compare some future social state against. The social interaction and dynamic is too complex to impose a measurable metric which will be of appropriate use later on. Such measurement is surely to focus attention on a particular dialogue throughout the change process. It is better to let emerge the change that is to happen and use the appropriate rigorous reflection that is the mainstay of Action Research as the analysis tool.

What makes me click?

Anything that is strongly felt or natural. When someone says that a certain procedure is xyz and to them this is a perfectly natural process then you can say that this must have some fairly firm roots as a social process. If the way that they make a change is 'well that's the way we've always done it' then this provides a stable comparison along some dimension that people can relate to later, hopefully it allows people to see how something is different.

When someone has a firm, or strong, view of how something should be done then this also means that there is some social reinforcement going on. I need to check this out with others. I can document these things and use them as devices to ascertain a change in the social process. Or, I can use these things to ascertain differences between micro systems,

i.e. between the managers and the workers, between the account managers and the design staff, or even between the design staff and product development manager. This sort of difference may also become evident between the different sites. When Paul went down to Hastings and compared his newly constructed flow chart with the dead sea scrolls (his flow chart seemed perfectly natural and the best practice) the Hastings people had some other processes that they felt were vital to the procedure and they added them in. Although this process is on a level below where I am looking for difference, it does highlight that some difference will exist between these geographically remote sites. How the different sites change their strategic issue processing dynamics through the use of e-mail is of significance to the research question. Of course this means that I will need to go to the Hastings site and have a little talk with them. I will use e-mail to communicate with them eventually, but right off the bat I think I will have to go down there and get some face to face stuff going.

What motivates me?

A kind of investigative spirit. I can't say that this is turning out as rigorous as I would like at the moment, it's a bit of a mess, and I guess this is to be expected. What I need to do is be on my toes and use a bit of intuition in the steering process. I at least need to have my eyes light up every now and again in order that I can invoke a bit of enthusiasm in the field. I need to get people interested in learning about the changes they make. What motivates me then, is when I begin to motivate others. If I can get people interested in using the technology for purposes that seem natural and beneficial to them, then I am

following the predictive spirit of my thesis. I guess I am not someone to be motivated, I am the motivator.

In theory I knew it was important to state the presuppositions of my research in any published representation of it. At this stage I knew that I had to record my assumptions and modus operandi at intervals, as they were likely to change over time. This recording process also allowed me to reflect on these major assumptions and change them if they conflicted with the ethical beliefs of the other research participants, or if they were *stupid*. Reflecting during the write up on this mid project reflection I realise that I had adopted a reasonable facsimile of an ethnographic study at an early stage, even though I had not had a great deal of exposure to the method or philosophy through the IS literature and course work in my honours degree. I had also assumed the philosophic stance of hermeneutics without being completely aware of it as well. This coincidence is less surprising as the *Social Construction of Reality* [Berger and Luckman, 1966] was one of a handful of academic books I had read cover to cover, and the concepts contained in it are fundamental to an interpretive philosophy.

My reflection also hints at my growing nervousness at not having made substantial technical changes within the organisation, while also being cautious about making illegitimate changes. Only in hindsight can I say that I had already achieved a great deal of research at this stage, at the time I was thinking that I would leave the organisation without any data or any knowledge. This thought motivated me to seek incremental

changes that I saw as being beneficial to the NPD team, and supported by the existing system administration structure.

5.6.6 Continuation of Technical Intervention

I sent an email to Tim asking if he had any thoughts about direction and whether he could meet with me. Realistically I expected to get a meeting arranged for a little over a week after this but the organisation had some very urgent contracts to settle and the research and dialogue had slowed considerably. I sent an email to Jeff asking if he could set up a discussion folder on the training public folder directory. I got some feed back from Jeff later in the day asking who had asked for this list, the response was slightly defensive, but in hindsight was in continuity with my perception of the overall company culture, which made individuals autonomous and responsible for local performance in an industrial process context. I sent this reply to validate the initial request;

><Jeff>

>
>I have had discussion with quite a few people after the sessions and it appears that there
>is some motivation on a personal level to be more sophisticated in the use of e-mail.
>However, there is also uncertainty and trepidation on how to proceed, I think that this
>forum (the discussion folder) would help in the cross flow of ideas and support, but it
>hasn't specifically been requested. As you yourself said, the public folders facility is
>under utilised, maybe because most people don't know it exists. This would be one way

>to raise this awareness.

>Robert

Jeff created a discussion folder within the Public Folder system where I deposited an electronic copy of the slides that I had been using in the tutorial sessions and I e-mailed Janet a message about where it was and how the staff could access it and comment about it. The purpose of this folder was to invite discussion of the tutorial sessions and to also allow people to post their hints and tips for using email. After encouraging individuals to use the discussion forum, and publicising its existence through email, we gave up on this eventually due to overwhelming apathy to the idea. Very few people that I was to later contact had seen the slides nor known of it's existence. When the file was pointed out to them, the time lag after the training sessions was too great to afford a motivation to respond.

I managed to stimulate some more interest in the NPD project, and after a meeting with Tim, I got the feeling that he wanted me to direct this project entirely, which I had not been doing because I was trying to stimulate change and not force it. So I gave Tim something of an ultimatum and directly asked him where we should have gone from that point. After circling the topic we decided to put it to the technical managers - the H.O.D.'s at their next meeting. Tim and I co-authored a simple proposal to describe what would happen.

It seemed to be that the community based style of consulting that I was aiming for (Chapter 2- Figure 5) was not seen as a legitimate process by some of the participants, who preferred that I lead the research project (as in Chapter 2 - Figure 4).

I also met with the manager of another facility who was interested in AR through his studies at Massey University doing an MBA. I offered to send him an instructional book and subsequently posted it. I sent the proposal that I had sent to Tim in order that I could broaden the involvement in the research project.

5.6.7 Full Steam Ahead

In April I attended a technical managers meeting. I was number three on the agenda and on at about midday. I arrived at 11:30am and sat outside the design meeting room. There was quite a bit of energetic debate going on inside, it did not sound completely civil. However, once in the room I introduced myself to those that I had not yet met and we discussed the types of changes that could be undertaken. Although the discussion of the changes was cordial I could not help but feel that the everyday pressures of the organisation were affecting the concentration of the participants on the topic of enquiry. The project was intended to subdue the academic and invoke the organisational; however, it was also proving to be difficult work. The resulting consensus was that we could start by using the public folder system to discuss the proposed changes to the NPD process that Paul had been working on. The public folder system supported moderated or unmoderated discussion lists that could be organised by thread, and that retained

authorship and date information.

Paul put these flow charts on the public folder, he sent it to the NPD group by email first asking for feedback. Paul was apologetic for sending the documents by email first, I believe he felt that he was tainting my experiment; however, Paul's actions were indicative of a non-use of the technology that was very informative. I told Paul that I would produce a data flow diagram using the information that had been constructed so far. We talked about this on the telephone - I rang him because after his apology I did not want to even appear to be chastising him in front of the group for not using the public folder. In June I finished a set of logical Data Flow Diagrams (DFD's) for the NPD process that went down two levels. I emailed the DFD's to Paul and he put these onto the public folder system.

5.6.8 Intensive Research

I was involved in a huge day in Hastings. I had to leave home before 5 am to travel to Paul's house, then we went to pick up Tim, then drove off to Hastings, to arrive at 10am stopping for coffee in Taupo just after sunrise. We had a coffee in the factory lunch room joined by Trevor and Harry, and then proceeded to the *Bunker* (their meeting room that was rather stark) and had a slice of cake as we started the session. Two new faces were there, Melanie who was in a role between Design and Technical, and Gordon who was the operations representative for the NPD improvement group.

Before this very long day my interactions had been limited to business locations and contexts; however, the '*road trip*' and the informal chats between sessions with some of the employees at the Hastings facility added a new level of awareness to my perceptions of the fabric of the context. During the trip I had been exposed to some of the discussion about inter-departmental cooperation. Specifically, the operations staff were not able to get input from the sales staff, or were intentionally not trying very hard to obtain it. Non-specifically, I was able to view the humour and personal components of the context outside of the work environment. The personal components were not on display very often in the work place, but I was reminded that they continually exist - they are normally just subdued.

The meeting started as usual with Trevor going over the last meeting's minutes point by point, although the order was not strictly adhered to nor did it appear that discussion was limited to each item. Issues that were covered were varied from SAP communications to the costing model that the sales people were using. What I started to understand was that some people in other group projects were making assumptions about the NPD process but had not clarified these assumptions via any form of communication. Obviously the intention to assist the NPD group with communication was well founded, as they were having difficulty developing their system to coordinate the activities in the remainder of the organisation. What was suggested was that a representative from the NPD group could communicate the concerns of the group within the other projects. At the time I noted that I would have preferred to have instigated some form of electronic

communication, but the situation did not present itself in a suitable configuration to make such a suggestion, and thankfully so. On reflection I was appreciative of my restraint in not pushing any particular change in too much of a proactive way.

The next item was technical support for sales. Most of the discussion here was about who was in what role and who reported to whom, where was each person, and what were their responsibilities? There is an assumption here that communication has to be between a pair of individuals who are given a precise set of responsibilities. The point was tabled because Nigel, a senior account manager, was due in Hastings the following week and so they would talk to him about involvement in the NPD process. At this point I was faced with a very difficult environment. The communication issues, to do with the development of the new system and the ongoing communication necessary for support and enquiry purposes, was a constellation of interacting operational, political, geographic, and cultural differences. The SMU project that was initially discussed with management seemed to be an integral part of the new NPD system. The idea that the geographically dispersed Strategic Marketing Units could communicate as a high performing team seemed to be the same goal as the interdisciplinary development of new products.

The meeting switched to discuss the requirements of the NPD process redesign. Strangely they were interested in the computer platform requirements for the system at an early stage, and the type of database management system they would need. I realised

at this stage that the culture of face to face meetings was deeply entrenched, and the engineering approach to problem solving was reductionist and incremental.

Paul gave an overview of the flow chart he and I had created. I introduced myself mainly for the benefit of the three people from the site I had not met. I introduced the context diagram and explained that it was important to figure out what parts were in the system and which parts were outside it. I then ran through the level zero DFD and several level 1 DFD's. Surprisingly, the local sales manager was the most enthused with the DFD's, but I also noted that others had positive comments. My major reflection at this stage was that the sales people may have been excluded more by the cultural differences and the language of the dialogue rather than the lack of communication channels or forums. The head of the local operations said that he wanted everyone to comment about the process flow chart on the public folders before the next meeting, and you can imagine my heart skipping a beat as I heard the team facilitator encourage the use of the public folder.

5.6.9 Positive Progress

I mentioned to my supervisor that I now felt good about the research, I felt that it was real ethnography, and I was wholly immersed. These people were not participating in my research project, I was participating in their daily lives and looking at real change. There was no way that this could be faked, it was not a hypothetical situation, nor was it in any way controlled or synthetic, it was real, and the learning that comes from it seemed to be substantive. And, what is more, I was really enjoying it.

5.6.10 Reflection on the NPD Project

The people that I have presented to, or trained, showed an interest in better using; folders, rules, personal groups, and public folders. They saw the utility in them. I was particularly aware of the interest that people showed for the public folders, once they were made aware of their existence they started coming out with ideas that they could implement. One such example involved the individual who did the ISO 9001 documentation. He wanted to know if he could put the process descriptions on the public folder so that other people could comment on them and have collaborative change. Others saw utility for process improvement and the quality initiatives that had been talked about when I went to Hastings had been set up with a range of public folders for meeting minutes and documentation. However, discussion was not an element utilised in the folder system.

I tried to instigate a reflection of the NPD project on the public folder system but I was disappointed by the lack of response even though there was face to face reinforcement of the intervention. After collecting further accounts from individuals it is evident that the dissemination of documentation is a legitimate part of the companies culture, but the organisation of opinion sharing was not. The '*reflections*' were subjective accounts and not conducive to the culture of pragmatism and rationality.

5.6.11 SMU Cycle Shelved

I visited the Albany plant to speak with an executive in Marketing, Brad, in order to investigate the Strategic Marketing Units (SMU) project. There was a manager just at

the end of the office who was involved in a quality initiative project and the SAP implementation coordination, and there was someone else who was involved in ISO accreditation. The marketing staff had involvement in several projects and their focus was evident through the display of paraphernalia or proximity of the coordinators of these projects. The NPD project on the other hand, had no actual presence.

Brad seemed quite happy with the communication that occurred within the SMU teams, although he had many concerns about the communication of data between the different functions i.e. pricing, development, accounting, purchasing, and operations. Most of the issues that he came up with came down to meshing his plans with the legacy systems and policies. I got a structure chart from him, this showed the sales force and the technical support for each of the units. He said he would have liked the R&D people to report to sales and marketing. The comments I was receiving from Brad supported my earlier awareness that the lack of communication between the technical staff and the marketing staff were cultural rather than an aspect of communication channel, ability, or accessibility. I had gathered from my discussion with the engineering staff that the SMU project had been shelved, but Brad was talking as though it was an operational concept.

Brad also mentioned that the cost of meeting was an issue, especially when one member of each group is based in Australia, and other members of the group are spread all over the country. The awareness that the costs involved in attending physical meetings were prohibitive was shared with the employees I had already been interacting with. The

technical managers explicitly stated that they could not afford to be attending meetings that took 4 hours to drive each way; however, they did so anyway.

I interviewed another couple of members of the Albany team, but at the end was convinced that there was not a cohesive task or group that I could work for in terms of a research client group for the SMU project. The structural chart that the marketing manager gave me visioned a geographically dispersed set of teams. The reality was that this vision would not eventuate if the sales and marketing personnel were habitually isolated from systems changes. An emancipatory cycle of Action Research could have been useful in this instance to change the system development process, but I thought that this went beyond the scope of this thesis, and more importantly, would have jeopardised existing relationships. To avoid aggravation between the operational and engineering staff and the account managers the SMU research cycle was not resurrected as there was insufficient dialogue or inertia to work with.

5.7 Conclusion of Organisational Change

5.7.1 Prior Cycle - Academic

In the academic cycle I participated as a co-researcher in the AR project of a colleague. I discovered the area that I wanted to research, and I refined the way I believed that I would need to do this. I was resolved to research the general nature of ACT's in an emergent and participatory way.

5.7.2 Management

I had many meetings with the management of the client organisation before I began research with a specific cohort. These meetings allowed us to communicate our intentions and needs, and allowed me to build a picture of the ethics and values of the research participants. Some of the picture that I built in this early cycle was found to be inconsistent with the user groups I worked with later, some of the picture was reinforced. The strategic objective of “*leveraging email for strategic advantage*” was wholly ignored by the user groups, whilst the culture of the management group and the user contexts was closely matched.

5.7.3 NPD

The pick up of the discussion on the public folders was weak even after several attempts and methods to stimulate it. The use of public folders soared and employees saw utility in the accessibility and ease of central file location. Public groups for discussion lists and automation of email tasks and functions were not seen as being of significant importance compared to the learning overheads or administration overheads to set them up. Email was perceived as being both a synchronous and an asynchronous form of communication.

Feedback about my involvement was encouraging, I had been asked to drive the change in some instances, and I did provide concrete action within acceptable bounds where appropriate. However, the participants were instrumental in directing the research process and content. The significant outcome of the NPD cycle was the knowledge that

ACT's were perceived by the participants as useful for information exchange and personal communication, but they were not perceived as being efficacious for open group discussion. Closed group discussion was facilitated constantly using email, but static folder systems were not useful for carrying discussion.

5.7.4 Training

Many individuals were trained in intermediate uses of the locally installed email and office productivity package. The feedback during the sessions confirmed some of the issues that were presented by the onsite technician. The employees did not like receiving short messages as attachments, and there was a low level of knowledge about public folders, public groups, and private groups. A small number of the participants showed some knowledge of the social norms of email use, such as SHOUTING and emoticons { :), :^ P, ; O, etc.}. However, those employees that were not aware of these social norms accepted them quickly through the referencing of them in my presentation, this gave the rules high order legitimacy.

The training session seemed to have a very thin impact on a large number of employees. The intention was to increase awareness of the tools available, in order to heighten the awareness and contemplation of using them. In the process of contemplating the use of technology I was envisioning learning from as many of the employees as possible. The informal and formal interviews that I undertook throughout the research allowed me to tap into this contemplation, and even if the training sessions were not the focus of a

change in behaviour in some cases it may have been the catalyst.

5.8 A Reflection on the Measures of Quality

One of the intentions of PAR is to pass along tools to the participants that allow them to carry on their own research and to enable them to emancipate themselves from derogating and unnecessary systems, structures, or policy's. Reflecting on the first suggested measures of quality for this work:

5.8.1 In the conclusion of this work is it evident that I was able to improve the practice of Action Research and improve the practice of Information Systems management and development?

One way in which PAR helps communities and individuals is by stimulating active reflection on action and activity. In this research project I was unable to persuade any of the participants to diarise their learning experiences in ways that are traditional in education and health. However, the sophistication that these participants had in process improvement and problem solving meant that many of them were equipped with some very useful tools for this activity. If anything, I simply created a critical space for the organisational members to explore their perceptions, an activity that seemed to be undertaken by them on a regular basis throughout the project.

In the end I believe that I left the participants much like they had been when I met them,

apart from some minor exceptions. In hindsight I can say two things about this result, the first thing is that these participants for the most part were already reflective practitioners, at least in terms of manufacturing process, and they already had the tools necessary to reflect on and improve their practise in that they had active Total Quality Management practices and activities in place. Secondly, and probably most importantly, I did not place as much emphasis as I should have on the process of self reflective skills transfer, and there are two reasons for this.

1) I was a novice at AR and I did not have knowledge of all of the methods that I could have used to encourage them to be more self reflective.

2) From a supervisory perspective, there was more emphasis placed on the negotiation of a topic and the creation of interventions than on the objectives that make PAR appropriately participatory. The cause of this was i) not having a suitable PAR style mentor, and ii) undertaking research with a methodology that was relatively new to IS, to my supervisors, and thus not prioritising characteristics of the research correctly.

One of the problems I encountered in this research project was with soliciting a research client and negotiating the research topic. In hindsight there were many aspects of this company that I could have researched that would have made a successful thesis topic. If I was to undertake this project again, I believe that going through the Yellow Pages and, other indexes, and contacting literally hundreds of companies with a predefined

topic would be the least desirable method I would choose. I would be much more likely to form a relationship with any company of a suitable size in the first instance. Bearing in mind that as a junior researcher such an organisation may not be open to such a research initiative to start with, other options could be available, the most obvious one being to seek employment in a general clerical or operational role, and then approach a senior member of staff after a suitable period with a research proposal on whichever topic seemed appropriate in the setting. This involvement first strategy obviously calls into question research ethics and uncertainty; however, putting the topic first and then trying to find a research client with a PAR project is a gamble of coincidence and also relies on a presumption of the researcher that he or she can make an improvement for the client and participants in a specific area, and from a PAR perspective it also poses ethical questions with regard to the topic initiative and value to the research participants. From a PAR perspective it might be more desirable to find a company that needs help first, and then define the topic in totality with the participants, but this process was not one that would have fitted with the process of proposal and candidacy that I went through.

Needless to say, and with the benefit of hindsight, the research could have gone better if I had more experience; however, one of the purposes of this project was to induct me into a community of researchers. My choice of community was the AR community evident in online discussion lists and online workshops, and this community supported me and provided me with direction and values. I attempted to stand true to the dual nature of Action Research in that I created positive change in the organisation, although

as discussed above I did not perceptually improve their reflective practices or emancipate them, and I also attempted to create genuinely grounded theory using a hermeneutic analysis of transcripts, diary notes, documents, observations, phone call notes, and email messages.

Fortunately, there is another question that I need to address, and that is whether I was able to improve my own practice as an IS practitioner and as an Action Researcher. For those that are interested in my opinion, my answer to this question is an emphatic yes. There may be some visibility of my slow improvement in this thesis, but I imagine that there is plenty that I have not said, and some that I would not be able to say. Some of the changes in my practice occurred so very slowly so as to appear natural, others may not be evident to me because I did not specifically reflect on them, or the need to test my learned ability will not arise until I conduct another project of a similar magnitude. The analogy that springs to mind is that of teaching. When I started teaching I know that I was nervous and sometimes ill prepared for events that unfolded. I am now more confident and better able to improve my delivery through active reflection and participatory methods. I do not believe that I would be as good a researcher or a teacher without using the principles of Action Research. As to the question of whether I could have done better, I have no answer.

5.8.2 Can this work be carried farther?

One of the aims of Chapters 1 and 2 was to describe the presuppositions of the research, while Chapter 4 described the type of interaction I had with the research participants. This Chapter outlines specific interactions and activities that were performed in the process of undertaking this process. From a PhD, and professional, perspective I hope that I have included sufficient description and advice to enable a novice to begin such a research project.

One thing that should not be underestimated is the difficulty a novice will have in getting this type of research accepted, even in the 21st Century, as the academics who are filtering research proposals are mindful of protecting the integrity of the institution and the success of the candidate. The more detailed and precise a proposal the more likely that the candidate will be allowed to start researching; however, in Action Research;

.. although the researcher's intent is to conduct research while effecting change, the approach is sometimes branded with the description 'consultancy' and not research. The open-endedness of such research and the consequent flexibility necessary in writing a research proposal also provide additional difficulties. [Avison, 1997:206].

This work, if it passes examination, may provide suitable supporting evidence of PAR

for IS PhD theses.

5.8.3 Have I been able to incorporate prior research while not prejudicing the theory development and knowledge explication from the field?

To evaluate this suggested quality measure it would take a summative reading of all of the chapters of this thesis. From the description of the method, the definition of grounded theory, and the variety of literature that was explored, through to the description of the process of analysis, and presentation of the results. The main nexus of this evaluation should probably be this chapter and the following chapter. The Data Analysis chapter discusses the process that was undertaken to analyse interview data and to incorporate other data in order to construct a set of specific behaviours and perception evident in the social context of this research project.

Understanding the context and the level of participation in the research from this chapter, and then understanding the methods used to discover theory elements and then to build it out to coherent theory is the likely answer to this quality issue.

6 Data Analysis

Thus the movement of understanding is constantly from the whole to the part and back to the whole. Our task is to extend in concentric circles the unity of the understood meaning. The harmony of all the details with the whole is the criterion of correct understanding. The failure to achieve this harmony means that understanding has failed [Gadamer, 1976:117]

The previous chapter outlined the start of the research and the impending data collection as a seemingly ad hoc affair. This reflects a learning process in terms of professional and behavioural change. However, the dual nature of AR and the need to produce some recognisable academic knowledge for a thesis, made essential the use of an appropriate rigorous control structure and the systematic collection of evidence, and the subsequent transformation into this written work. This section outlines the protocols used in collecting and interpreting data as well as the specific reasoning behind the methods. Of importance is the discussion of rigour and what it means within this interpretive work,

and the hermeneutic aspects of travelling between the macro and micro elements of the research in order to understand the accounts that were collected.

6.1 Rigour

The rigour of the data collection and analysis centred around the concepts of ethnography, which assisted with the protocols of involvement and intervention, and hermeneutics, which guided the interpretation of the texts resulting from the research.

From an AR facilitation perspective some data was continually collected to improve practice, and this assisted the conformance to a rigorous ethnographic method. I intentionally worked toward improving the rigour of the data that was collected from individuals in terms of being 'honest' local accounts. A perceived limitation of Action Research is that the researcher acts as a non-normal change agent and the interventions create an artificial context for the collection of data. I specifically set out to behave and act as an organisational member and not as a significantly 'different' or strange operator. I participated in focussed meetings and acted on occasion as a relative expert on Information Systems and Electronic Mail. If I were to classify my persona it would be as a junior consultant who had been asked to get to know the client and offer whatever services he could in order to gain trust and create an ongoing business relationship. In my interactions I would refrain from espousing value judgements about electronic mail or other communication mechanisms. I attempted to get the organisational members I

was mixing with to think about electronic mail and public folder use in order to think about anything that could be done to improve communication and organisational interaction in a number of contexts. Assuming that I recorded every interview in my notebook, I undertook 20 informal interviews with staff, attended about 40 to 50 hours of meetings, made at least 12 agenda planning phone calls, exchanged over 80 emails, and undertook 4 training sessions at each of two facilities, at which I received some feedback and thoughts from a large number of staff. I only captured two rounds of interviews on tape and transcribed them for deep analysis; however, in the context of the interaction that I had with the organisation the interviews that I did record were very rich and 'from the heart' open and constructive. My intention was to work toward the generation of extremely high quality interview transcriptions that would capture the essence of what was felt about ACT use and the types of change that were sought after by the research participants. The rigour that I created was the construction of a solid context, the generation of trust, the inhibition of my opinion, and the restraint of an academic structure on the change process.

I needed personal accounts that were well detailed and that lived within a context that was known and well defined to be able to understand the weight of what was said about email use and proposed changes to use. The hermeneutic perspective is that to understand something that someone has said you have to understand the surrounding context, so I made sure that I nurtured my understanding of the context while simultaneously focusing thought on the issue that I was studying, whilst promoting

freedom of expression and freedom of action. More importantly I had to restrain my desire to study specific things that the organisational actors had no interest in pursuing. The overt goals of the management personnel that I initially met with espoused '*leveraging email for strategic advantage*' whilst most people who heard that phrase at the operational level were either stupefied or incapable of responding seriously. One of the problems that I had was a desire to fit in as much 'stuff' as possible about Asynchronous Communication Technologies as I could, to satisfy my supervisory panel that I was actually studying the topic, whilst at the rock face there was significant apathy toward using ACT's in different ways. My decision was not to force a change that would not have been immediately gratifying to the participating organisational members in order to satisfy an academic inventory of relevance, as I saw this as jeopardising the external validity of the findings and making the process less rigorous in a methodological sense.

To rigorously interpret the texts that were collected from this research a number of key hermeneutic principles were employed, specifically, a method was needed to find significant findings, where significance was (adapted from Love [1992:123-124], modification in italics):

- 1) Repetition within and across interviews. Ideas, beliefs, concerns, and issues that *participants* discuss repeatedly throughout the interview or/and are brought up at least once in an interview and are then again noted in other interviews are considered

significant.

2) Levels and nature of affect. This includes emotion that is evident through nonverbal cues such as a sudden rise in vocal volume, change in facial expressions and other bodily movements all noted concomitantly with particular content lend significance to that content or theme.

3) Historical explanations, descriptions, and interpretations. Stories of the past that explain and justify present behaviours and meanings are considered significant.

4) Explicit and implicit interpretations. These require connections between thoughts and activities and meanings ascribed to them whether they be obvious and direct or implied and metaphoric. These interpretations are considered significant.

5) Serendipity. Behaviours and expressions of the participants that are different from what was expected, based upon my reading and experience. These unexpected surprises are significant since they allow the research to recognise ideas which have not yet been published.

In order to find significant issues or themes the need to find repetition in the first instance was seen as a primary objective. A methodical process was sought to organise the data so that repetition could be found, and interpretations could be recorded, with some

aspects of the level of effect captured. This process is described in the following section, the subsequent section then explains the Hermeneutic analysis that occupies points 3 and 4 above. The grounded aspect of the data and analysis then places point 5, Serendipity, mainly in the Discussion and Future Research chapter.

6.2 Statistical Clues - Data Mining

In order to be able to sift through the electronic transcripts and be able to organise elements according to content and connections a qualitative data analysis computer based package was used. Initial investigations into alternatives steered me away from using the most common of these tools, Nudist™, and I chose a lesser known equivalent package that seemed to have more flexibility, Code-a-text™. Code-a-text™ was initially developed by Alan Cartwright (1999) for psychoanalysis. Code-a-text™ was designed to be used by an analyst to analyse video or audio recordings of an individual's or group's therapy sessions. Code-a-text™ can also be used to train the analyst by providing a facility for recording interpretations and comparing multiple interpretations. Rather than spend an inordinate time travelling through the texts and coding speech segments according to the researcher's interpretations, which can often be an extremely lengthy process due to the creation of multiple categories and iterative, evolutionary, coding practices, Code-a-text™ provided much more powerful searching and content analysis tools.

This software seemed to be much more appropriate for the type of data and the intended data analysis process that I predicted to be ideal for this project. Rather than a tedious and unnecessary interpretations stage, which places an undue cognitive and abstractive load on the analyst, the processes embedded in Code-a-text™ which are suited to psychoanalysis are also appropriate for deep hermeneutic analysis without losing the contextualisation of the data.

Rather ironically then, I used statistical content analysis to determine an overall feel of the texts in order to focus my search for specific evidence that was representative of the overall population. This was only a primary step in order to create a sequence of data that could be navigated more intelligently. In actuality my use of a *Qualitative* data analysis package was only for navigation and early organisation. The analysis of *Knowledge* was undertaken in the subsequent Hermeneutic analysis discussed later in this chapter.

In brief, these are the steps that were undertaken using technological tools to record data and stories, and to capture a picture of major associations conceived by the participants.

- I. Key interviews were recorded
- II. Recorded interviews were transcribed. However, two interviews were of poor recorded quality due to factory noises. These interviews were not transcribed, but

the notes taken during the interview, and audible sections of the tapes, were incorporated into the final analysis.

III. Interviews were parsed into Code-a-text and words that were new to the coding frame were identified as either being active or passive. The rule that was used to decide on whether a word was active was simply that if the word as a signifier held meaning in the context of the research, it was considered active. To illuminate the difference a random selection of passive and active words are included in Table 6. The words were extracted from the word archive and represent the word at the top of the page after the <Page Down> key was pressed three times.

Word	Status	Reason, where necessary
Ahh	passive	
appropriate	active grouped word - legitimate	This was considered to represent a relationship between some thing and an activity. Searching for this word could yield a statement of perceived purpose or characteristic.
bad	active grouped word - bad	Some words fall into a grey area and although this word could yield quite different search outcomes it was also a expression feeling toward something or some action.
bolts	passive	In this context bolts may refer to a generic saying 'the nuts and bolts', but being in a factor environment is more likely to relate to general operational aspects of work.
can't	active	A negative relationship word that may have been useful for searching purposes.

close	passive	An word with many meanings in different contexts that would provide loosely related search results.	
consider	passive	Not a qualitative word and not a relational word, consider would not yield useful information in a search.	
culture	active	Culture is an aspect of an organisation that would be interesting to identify for exploration.	
design	active	Design is something that is useful to identify and was treated as an active word. The existence of a design department split the meaning of this word, but it was useful to use in a search.	
does	passive		
eforms	active grouped word - technology	This represents a specific method of structured asynchronous communication technology that was proposed for use but not in normal use at the end of the research.	
eventuality	passive		
falls	passive		
forty	passive		
gonna	passive		
he'd	active grouped word - colleague	The people interviewed would often talk about their colleagues in terms of he, she, he'd etc. and this proved a useful category	
Total number of different words	Number of active words	Number of passive words	Number of grouped words
3120	1682	1438	719

Table 6 - Classification of Words as Active, Passive, or Grouped.

IV. The active words were then navigated on multiple occasions to ascertain if there were collections of words with similar meanings. From the end of Table 6 it can be seen that 719 words were considered to be similar in meaning. One example of this is the word group *affect*\$. The \$ sign is used in Code-a-text to denote a word group and is used in this thesis similarly. The *affect*\$ group included the words (these are case sensitive):

*affect, Change, affected, change, changed, changes, changing,
factor, frustrated, impact, impacts, frustrating, and frustration.*

V. These words were all spoken by either the interviewer or the interviewed and can all be considered to be relating some sort of change process, or affect. Not all of these words were positive, indeed a word group cannot be thought of as carrying the same sense as the group name. For instance, I included both negative and positive effect words in the group *benefit*\$. The coexistence of a number of word groups can tell us that there has been discussion using words from these groups, but the interpretation of the actual meaning must be made locally at the text and at the text fragment in relation to the context.

VI. Once the word groups were constructed these were turned into scales and the texts were re-indexed using the completed coding frame.

VII. The first round of interviews were also parsed into Code-a-text and the word

archive from the final round was imported to allow for comparison and expanded with new words. Another word group *political* had to be added to accommodate a number of new words added to the archive from the inclusion of the interviews from the tertiary education provider. Some of the word groups were expanded with new words. The archive of all words after this addition rose to 5063.

- VIII. Scale analysis was carried out which found out the relationship between scales.
- IX. Searches were carried out which produced text that represented these major connections.
- X. Meaning was attributed to statements in connection to the context that the statement was made.

Once relevant sections of the transcripts had been identified, the task of performing analysis to build theory was undertaken. From an interpretive perspective some direction had already been developed during the longitudinal research process. Having spent a reasonably long time with certain individuals and the company as a whole, I had already started to form an opinion about the general usage of the technologies. My analysis of the transcripts, forming one *whole* data set, allowed me to navigate between the *parts* of the data set, and to also treat the data set as a *part* of the research project. The research project also had many parts; however, the best documented and arguably the most

rigorous part, was the interview data, and although it was by comparison small in the scale of my interaction with the client, the quality of the data that I had sought made it a focal point of analysis by which the other parts could be compared.

6.3 Hermeneutic Analysis

One aspect of AR that I soon become familiar with from dialogue amongst the AR community is that Action Researchers talk about the research process as a combination of cycles {planning, action, reflection, learning} within cycles. Reflectively, my research project ran within the meta cycle of doctoral candidacy, whilst an identified intervention cycle of training for instance had many sub cycles of training sessions, each with its own preparation, planning, action, reflection, and learning components. Whether this aspect of AR is a reinterpretation of an independently created subset of philosophy or whether it was informed by hermeneutic theory is beyond the scope of this thesis; however, the transition between AR and a hermeneutic analysis of the project data is a comfortable one. The use of hermeneutics was not planned at the beginning of this project as the support for hermeneutics and intensive interpretive research arose after the research was instigated and well underway. Of significant note; however, I had read the work of Berger and Luckman [1966] prior to starting the research, so therefore, although I had not touched on rigorous hermeneutics I was informed by the guiding principles of Interpretivism.

AR was being used by others as an umbrella for process validity and the data collected by a colleague, who was completing his AR project, was analysed in a pragmatic way rather than relying on a specific philosophical approach. Fortunately, the work of Myers and Klein [1999] provided a set of principles to understand the philosophical approach that I had adopted after I recognised that I suffered from a philosophical vacuum. Paramount of these principles of interpretive studies was the hermeneutic circle. This latter investigation into philosophy, also created quite a problem in terms of the methodology that I was using. After some further reading I was unable to determine the extent to which my AR project was in fact an ethnographic study and how much it was AR. With trepidation I retained the mantle of Action Research in that the reflective practitioner aspect is a worthwhile cause to promote in IS research and practice.

The difference in the nature of an AR project and an Ethnographic project has not been the focus of attention in the IS or organisational studies literature. Perhaps the only element of difference is in the transference of research skills to participants. Some ethnography may very well incorporate a change element that is participatory, so change in itself could not be a definitive difference. In hindsight it is not difficult to see my confusion over this point, but I believe the explanation within table 7 may assist in the explanation of the use of the two terms, in that PAR was used as an overriding process (Methodology) and Ethnographic Interviewing and Hermeneutic Analysis were used as the tools of the research (Methods).

Epistimology	Social Constructionism Interpretivism
Methodology	Participatory Action Research
Methods	Action Research Cycle of improvement Ethnographic Interviewing Anthropological Observation Hermeneutic Analysis

Table 7 - Distinction between methodology and methods of the research.

Another perspective, according to Avison, Lau, Myers, and Nielsen, should possibly be research in practice [1999]. The collegial community that is evident in Education AR would be useful in IS, just as Critten promotes the work of Schon for general business practitioners [1999].

Once the statements and interpretations were summarised the major concepts that were *prima facie* supported were investigated across participants and across data sets.

6.4 Summary of and Limitations of Data Analysis

Data was gathered throughout the study. Before the first day of interaction I was accumulating context data from my involvement with a colleague in a related research project. In terms of Action Research having an objective of methodological improvement I also collected knowledge about the method, and how I could use it in this particular setting.

Data was gathered through field notes, audio diaries, organisational documents, observation, and participant accounts. The analysis was in the first instance driven by the participant accounts; however, the analysis was filled out with information from my field notes to capture important events and interpretations made during the longitudinal study.

The participant accounts formed a useful grounded data set to initiate the Hermeneutic analysis. The movement from the part (an account) to the whole (the organisation) and back in a hermeneutic circle worked in the following manner; All of the works were summarised statistically at a lexical level, going from part to whole because major associations were derived from the individual spoken words. The lexical searching and reporting allowed a very broad descriptive perspective on the overall frequency of discussion on certain topics. This *whole* allowed the isolation of significant discussion on the intersections of already isolated categories. The results of the search yielded

actual text fragments reported in context (within a larger block of text and including the interaction with the researcher), therefore, going from whole to part. The text fragments were interpreted in terms of the broader context, which was known to the researcher, and hence the last iteration of part to whole as a contextualised interpretation.

Initial expectations of data analysis were that a very rigorous approach would be required to decipher the texts produced from this study. In some ways this may be true, for example, being able to link the narrative of my diary and meeting minutes, with a multitude of participant accounts may have provided a greater measure of how well individual concepts were supported. However, only the very simple features of the software analysis tools were used, and analysis was predominantly conducted by referring to field notes for clarification when needed by conducting text searches. Often my memory was sufficient to place the very rich participant account into context as I had involvement in all aspects of the research. The one constraint I would place on the analysis tools used in this project is that the method would not be scalable to more massive, or multiple researcher projects. Problems could begin to emerge when attempting to make interpretations of accounts without direct experience of the event or the context. I do not think that too many instances occurred where I was outside of the context, and where I was aware of this I attempted to gain access to the context. The specific example that I can describe is travelling to a distant facility to talk to marketing personnel.

One specific limitation of the software tool that I became aware of was that complex searches tended to become unreliable. I initially attempted to produce very specific reports that were supposed intersections of two or three active terms (i.e. email and groups and effectiveness). I soon realised that the software tool missed many instances of supporting comments when participants did not mention one of these terms directly. A good tradeoff between actively coding every interpretation manually, and dealing with an incomplete subset, was to undertake more general searches with fewer constraints. As I ended up going through every transcription, and each diary note, multiple times throughout the analysis stage the process was very time consuming. However, I do not believe that the knowledge that was generated was constrained by the tools employed because I made critical reflections of the process throughout the analysis and changed the strategies to minimise the influence of the process on the knowledge generated.

The process of collecting these interpretation fragments and comparing them against the context occurs in the upcoming Results chapter. The Conclusion, and Discussion and Future Research chapters then summarise this knowledge and attempt to place it more broadly.

6.4.1 Member Checks

In intensive interpretive research there are a number of ways to ensure that there has been a true representation of the local 'truth'. One way that is common in Action Research is through the use of 'Member Checks'. The researcher who is working with members

of the organisation and making interpretations, therefore creating 'Learning', feeds this learning back to the participants who check it for truthfulness. Other ways that the researcher can ensure the internal validity of the findings are 'prolonged engagement' (Philpott and Strange, 2003:81), 'persistent observation', and 'triangulation' (Melrose, 2001:169). I employed some level of member checking at early stages of the research, but wholly relied upon other methods at latter stages to ensure that the local truth was being properly represented.

Member checks were not carried out toward the end because of three circumstances. The first circumstance was that the organisation had changed ownership and name, the tenuous legitimacy of the initial research project was further eroded. The second circumstance was distance, as I was then living quite some distance from the main facility, and further from the other two facilities where I had undertaken other parts of the project. The remaining inhibiting circumstance was the shifting of personnel between and within the company. Some of the main participants had been promoted or had moved, whilst the original sponsor had since retired.

The lack of member checks should not be seen as a lack of validity as the main method of enforcing rigour was informed by hermeneutics rather than the pragmatism of Action Research. Melrose also says that of PhD Action Research projects the ...

... student is often more driver (through the various AR cycles), facilitator,

recorder, and writer than others in the group. The topic of practice and theory building for an AR thesis must be sustainable by the student through the duration of the research project, even if the group of participants changes with the cycles.

(Melrose, 2001:162)

Melrose (2001:164) further discusses validity in qualitative research, and Action Research in particular, outlining, among other things, that validity can take on a broader definition. Perhaps it is important to determine whether some of the methods for determining validity in AR, such as Member Checks are alternatives for the variety of types of rigour that are being sought for such things as Education Practice. It is, therefore, important to consider the difference in context between educational, health, and community AR and Organisational AR. In the organisation I was involved with the practitioners most probably had quite different reflective practices than educators or community workers. The apparent dissimilarity with normal AR participant reflective practices accentuated the common difficulties of obtaining member checks, in that;

Some participants may lose interest in the interpretation, theory building, and reporting stages of research, and they should not be coerced into continuing. However, their contribution should be acknowledged in any paper or product arising from the research. (Melrose, 2001:170)

Although in this area it is suggested that it is important to involve as many participants

as possible in the interpretation of the results it should also be noted that much of this dialogue is related to the interpretation of journals (2001:171) and ad hoc data collection. In any situation where theory is being developed from non rigorous data collection methods it should be checked with the participants to ensure the truthfulness of the accounts, but in the case of a rigorous approach to data collection and analysis, I suggest that it is not essential and adds only a marginal degree of confidence in the results.

7 Results

No I don't think there has been any change. The way I see it, email is only a tool to provide information it's not really going to change the way you have to decide things. You still need to look at all the information .. a big part of making the best decision.

Mike (pseudonym), CHHp Cycle.

In an Action Research study results are forthcoming at various points in the research process. In the described cycles of 1) Academic 2) Management 3) NPD 4) Training and 5) Writing, there have been a variety of outputs that have allowed me to either guide the research {process} or to draw conclusions about the email theory {content}, and these are summarised in Table 8.

Cycle Name	Period	Process Results	Content Results
Academic - Including Prior Cycle	Mid 97	A method with reduced academic control was adopted.	Insights into group mediated email communication were gained.
Management	Late 97 to Early 98	The initial expectation was to have a semi-formal proposal with a list of expected interventions. The management cycle ended with a very casual approach, and limited expectations of specific interventions, and a subscription to organisational learning.	The managers described specific problems that had arisen with email, and had stated their desire to <i>“leverage email for strategic advantage.”</i>
NPD	Early 98 to Early 99	The research process was subsumed by a business process improvement activity, with a second level reflection process.	The desire to investigate discussion list servers and moderated lists was hampered because no body else wanted / was able to do this. Efforts were redirected toward use of public folders. And facilitating discussion between development user groups. Knowledge about ACT use was gathered in this context.

Training	Mid 98 to Late 98	Mini cycles of training were performed, which allowed an appreciation of the use of email from a wide collection of staff throughout two major facilities.	The topic of enquiry was devolving from a desire to study specific technical aspects of ACT's to simply understanding the actual social use of email.
Writing	Late 99 to Late 01 ³¹	A hermeneutic approach was adopted to understand the research transcripts in the context of the research activity and organisational experience.	Analysis of the very open data revealed some consistent perceptions of certain aspects of email use. Cocktail party discussion and Media Genre are two of the more coherent and well supported issues arising from this data.

Table 8 - The Major Research Cycles and Outputs

The outcome from the two major rounds of interviewing placed into the context of the organisational interaction follows in this chapter. Following the principle of Abstraction and Generalisation (Klein and Myers, 1999:82) the first results that are presented in this chapter are organised and explained using the appropriate frameworks of Technological Democracy and Genre Theory. After a summary of the results, the process of describing each outcome relates to the hermeneutic process of relating the minor to the major, in each case a representative speech unit will be presented as an explanation of what each

³¹I started working full time and was granted a suspension. Interviewing was also undertaken during 1999.

of these concepts means in terms of the overall context of the individual and the organisation. The analysis and description of the data also relies on a comparison to the context as described in the field notes and historical stories.

7.1 Defining the Results In Relation To Email

Discussion of Asynchronous Communication Technologies in context revolved around discussion of Electronic Mail and a proprietary 'Public Folder' system, part of the Microsoft Exchange Server™ implementation. The discussion of the Public Folders had perceivably less energy than the discussion of email and therefore the email\$ word group *scale* was used to find relationships with other concepts / issues as a starting point for evidence that can be used to build theory. At this point it must be reinforced that this process was used to navigate the formally transcribed data in order to find similarities between the content of what people said. It should be noted that this process itself is not creating any interpretation of the transcribed spoken word, nor is the this particular data set the only evidence that is used in the interpretation. However, for the purposes of framing, I found the collection of this set of data, analysing it in terms of word counts and correlations, and creating reports based on the coincidence of word groups, to be a useful process in order to build a rich picture of the major parameters of the data set. Knowing how many words were spoken by myself and the respondents, and how *loaded* those words were is also a useful exercise. The dialogue that follows this section is used to create a picture of the interaction between the interviewer and the interviewee in terms

of concept saturation. Ideally, I was attempting to ask questions about the communication technology without influencing the response, and therefore as a general rule, the less I said about anything important the better.

In the following data, the instance of a scale occurring relates to the existence of any word within the word group being in a speech segment. A speech segment is the continuous dialogue of an individual before the interruption or continuation by another party. Speech segments can be broken down into speech units if more than one major concept is included, but initial investigation showed that this was not necessary, and such sensitivity would probably be mostly useful for the intensive and complete analysis of a psychoanalysis case which was the original purpose of the qualitative analysis software.

When the scale exists it registers a boolean *True* for the speech segment. The scales analysis identifies all of the occasions where email\$ is true and compares the other scales against these occurrences. Naturally, communicate\$ occurred far more often than the other scales.

Table 9 - Coincidence of Occurrence of Communicate and Email

	Scale communicate\$			
	N	Total	N % Sel	N % Total
False	42	435	0.362	0.097
True	74	177	0.638	0.418

Recorded discussion about email is often going to invoke a word associated with communication {ie. I *talked* to Henry on *email*} and hence the fact that communicate\$ occurs about 64% of the time that email\$ does (N % Sel). The 'N % Total' identifies the number of times that communicate\$ appears with email\$ as a percentage of the number of times it appears in total. The percentage of communicate\$ being *True* out of all instances when it is true is about 42%; however, it has a smaller percentage of *False* in proportion of all occurrences of *False*.

In association with email the majority of scales had much smaller occurrences of correlation. Out of 116 occurrences of email\$ the following scales registered $N = True$ occurrences which represented $N \% Total = Percentage$ of all *True* occurrences of this scale, as shown in Table 10. It should of course be noted that a term that was associated with the email\$ word group appearing in a 200 word paragraph is likely to be associated with multiple other concepts.

Table 10 - Coincidence of Occurrence of Word Group Scales.

Scale	N	N % Total
ability\$	16	41
communicate\$	74	42
affect\$	11	46
benefit\$	18	45
distribution\$	18	75
organisational\$	20	35
effective\$	18	37

files\$	25	44
control\$	14	30
decisions\$	35	39
legitimate\$	26	45
efficient\$	12	47
emotion\$	29	34
group\$	5	50
enables\$	2	67
learning\$	37	26

It is clear that email\$ is talked about in association with communicate\$, what is not clear is the qualitative, emotive and affective relationships between these terms. In order to discover how email is perceived to relate to communication several searches for text were undertaken with various parameters based on the larger number occurrences from Table 10 and synergistic groupings {ie. effectiveness + efficiency} were used to be able to produce reports of discussion on particular topics. These are presented in the subsequent sections; however, the relationship between the two data sets {Academic, NPD} was explored to determine both; issue differences, and interview rigour in terms of participant independence.

7.2 Comparing Interview Process - Ethnographic Rigour

This AR project had much in common with an ethnographic study. Burgess [1995] describes four features of researchers undertaking an ethnography.

- 1) The research work occurs in the natural environment of the subjects being studied. The researcher can gain insight data from the participants in a longitudinal fashion.
- 2) The researcher has flexibility with their ideas as circumstances change.
- 3) Using ethnography allows the researcher to observe the social processes and to be able to search for meanings of the actions of the participants.
- 4) Data is collected and analysed simultaneously during the ethnographic study, and results in theory emerging from the data collected rather than from imposing theory on the data.

In line with these ethnographic principles, one of the emerging objectives of the interviewing process was to allow the participants to tell me what they believed about their perceptions and use of email without prejudice. One way that this interaction can be analysed is to present the interactions in a linear representation of the issues covered by the interviewer and interviewee for the two Action cycles, as in Figure 9. These interaction profiles show that the structured interviewing undertaken in the first stage of the research {shown in the bottom row} presented a 'ping pong' of active words, thus suggesting a higher level of influence. The dense blocks of issue coverage by the interviewee in the top sequence highlights the outcome of the attempts to generate unbiased 'free flowing' output.

After the AR cycle that I collaborated on I determined that the structured interviewing approach used in this process was ‘leading’ the discussion to subjects that were

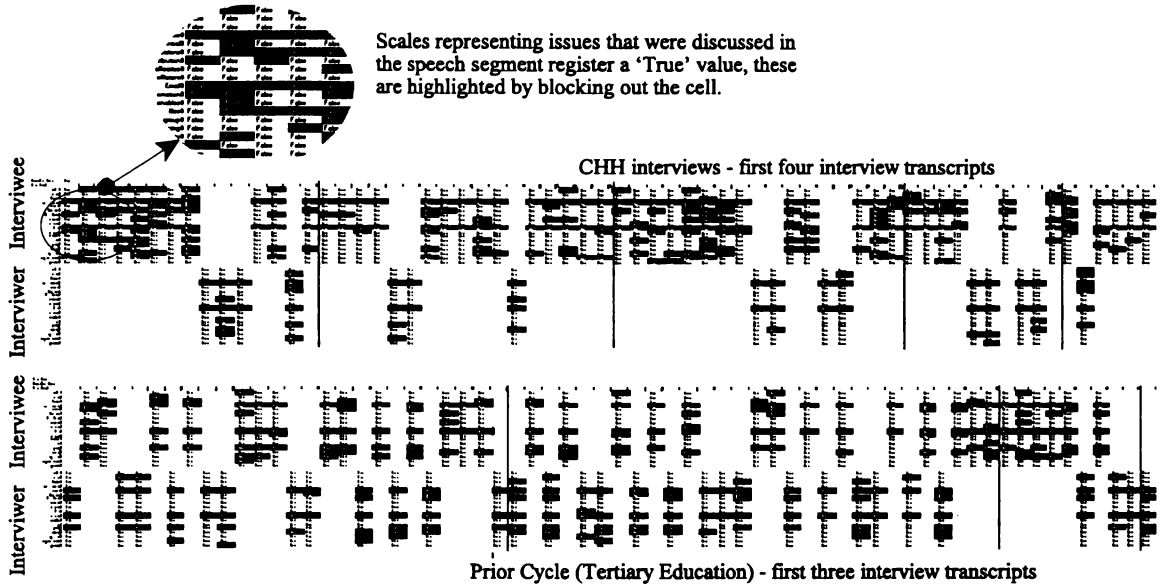


Figure 9 - A comparison between interview interactions {ethnographic style Vs semi structured interview style}

academically stimulating; however, I was unsure of how grounded they were in reality.

Later I determined that I would use an ethnographic style, where you may have an extended period of time for collecting data, and you may not ask specific questions, but allow the interviewee to tell you what they want to tell you until you have covered relevant issues. This raises two points, 1) that my field notes hold the key to many issues that were discussed over an extended period of time and need to be integrated into the results process, and 2) a process needs to be used to determine if my interview ‘method’ is being improved over time.

Illustrative of this interaction are two extracts in context from the two separate AR cycles. To choose the appropriate segments a search was undertaken to find an instance in each record-set of where the discussion included {legitimacy + decisions + email}. These two contextualised segments are presented below. The first three results in the first successful search of both data sets, are presented in blocks of interactions. The segment in between the beginning and the ending segment would have been the segment that triggered the search result.

Search Result Excerpt from Tertiary Education - Prior Cycle

*Interviewee, Segment 3***** Beginning of in Context Group*

Yes as a facilitator for the group I could have explained it better because I know that {name1} mentioned...Not {name1}, somebody said to me they did not know where they were sometimes. They lost and I think I could have explained better, but you did not get people going off the topic. Like in face to face you are always pulling people "okay we are not discussing that at the moment", and you are always pulling back to the thing, and you don't have to do that on an email.

*Interviewer, Segment 4** Selected Segment*

How do you think the fact that email filters non verbal queues in group discussions, like body movements and personnel appearance, and things like that, that convey information and knowledge about those group members, how did it affect the group discussion?

*Interviewee, Segment 5 **End of group*

I think that some of the people that...Given that I know everybody in the group, I

know who they are, some of them would not have otherwise contributed in a face to face conversation, definitely contributed really well in an email. I don't think that it made much difference to me, because in my mind I was writing to those people in terms of who they are, but certainly well certainly Jenny contributed way more than I would have expected her to do otherwise.

*Interviewee, Segment 49***** Beginning of in Context Group*

I don't understand that.

*Interviewer, Segment 50**Selected Segment*

For example, in process improvement groups you normally learn about the process that is being improved, and about other peoples' opinions and beliefs that they say when they are contributing, they put some other things forward about themselves and so on. These are called learning, social learning, and, the previous one about the process, is called process-related learning. Do you think that email support increases this type of learning or decreases it?

*Interviewee, Segment 51**End of group*

Of the two people in this group that I did not know very well I certainly learnt more about them. I was surprised that I did actually, but I certainly did. The other people I already knew, and I was not surprised by any of their responses, but two of them I was surprised.

*Interviewee, Segment 57 ***** Beginning of in Context Group*

I can mention names, can't I? The two people that I was involved, I didn't know them very well. {name2} I found out is a very methodical thinker, very logical and holds his opinions very strongly which I did not ever had that opinion of him before, and I think that

that is a true view of what he was. My view of {name3} was a little bit more exaggerated, given that I did not like the tone of one of his messages, and I thought that it was just a bad day for him, but then I talked to you about it, and you said "no this is actually the way that he operates", and so the more exaggerated view I got on the email I had confirmed outside of the email system. But I certainly was surprised that people got that personality thing across on the email because I thought that, that would have been filtered out to some extent.

*Interviewer, Segment 58**Selected Segment*

Do you think that managers in general, that are related in some way to the people that participate in the group discussions, or managers that participate in the group discussions themselves, would give more support to the decisions that are made by the group if the group was supported by email or not, or would give less support, more support to a face to face meeting?

*Interviewee, Segment 59 Speaker **End of group*

I think they would give more support to the email, because a lot of managers run hot and cold in ideas, and can get really keen in a meeting and then it kind of beats out afterwards. You know how it happens, whereas in email how I felt bad about {name3}'s message because it was written down. I think if I had given a commitment to do something it would be written down and I would feel obliged to follow that up. So I think that, that commitment and obligation is strengthened because you have actually got it in writing in some permanent way. And it is not just an idea that you got keen on one day and went cold on the next day. So I think people would feel more of an obligation. I mean {name 1} has in writing undertaken to do this particular job, and I think she will do it.

The excerpt from the prior cycle shows that the interviewer has predetermined categories

that he is asking questions from, for example the question *“How do you think the fact that email filters non verbal queues in group discussions, like body movements and personnel appearance, and things like that”* contains explicit reference to social presence theory, and will undoubtedly influence the response.

The search result in each of these cases focuses on something the interviewer has asked, the segments 4, 50, & 58 were the selected segments returned from the search. It should be noted that, although the process to find these segments was undertaken randomly, and the results show a very convincing difference in style, on further investigation I found some instances where influence was apparent in the CHH interviews and instances where there was little influence in the Prior interviews. There were differences between respondents, in that some respondents were not overly forthcoming with comments unless prompted. I did explicitly encourage participants to just open up and say what ever they wanted to, my typical phrase was *“I don’t like to ask really difficult questions, so if you just want to just keep on talking, I hopefully won’t have to ask you anything”*.

From this random process of excerpt selection can be seen a definite difference in interviewer style, in that the following transcript shows that the interviewee is the focus of the search selection, and that the interviewer is asking shorter, less leading, questions.

Search Result Excerpt from CHH - Main Cycle

*Interviewer, Segment 10 ***** Beginning of in Context Group*

So that was your customers asking?

*Interviewee, Segment 11 **Selected Segment*

No mainly supp..., .. Both, customers and suppliers .. We needed to get quotations and technical information, actually at about the same time we got up running with our SDRC design system, and the power of that we could actually transmit drawing files electronically. Because we realised the limitation in having to get hard files from a to b like a drawing which was generally outside an a4 size, outsized a fax. If you did send drawings you had a cut and paste exercise so you'd have 10 a4 sheets, it was like a jigsaw back in those days. What I appreciated about email was just the fact .. I got lazy on the personal use of the telephone, I always use it hands free, I just punch a number and it could be ringing and I just do it hands free and I could be doing something else. It's ringing, and then the receptionist puts you through and with a 5 minute phone call you could lose upwards of two minutes just about from the start process to the end. The fax is not so bad you are not so dependent on time, but you either have to get a fax blank and write it, or we have a template, go to your damn machine, write it, print it off and then fax it to send the thing. And then there is a delay, so you usually wait around to see if it goes - so the end time is probably about 5 minutes to send a fax. Email is great, because you can just send it, it's live and interactive it is so - it can be formal or informal or whatever, it is totally flexible. The ability to attach files is extremely useful, I am very adept at email but I find that I use Excel a lot as a decision making tool, or using Word attach it to email make some comments to the attachment and then you can set up a conference call and say well you got the information you can bring it up on the screen you can be looking at the same information. They can manipulate, if you allow them to, they can manipulate your file and send it back to you. The whole thing is so convenient.

*Interviewer, Segment 12 **End of group*

So you use Excel for personal decision making but then you can share that with other people?

*Interviewer, Segment 22 ***** Beginning of in Context Group*

Do you think that is just individually or do you think that is with groups as well?

*Interviewee, Segment 23 **Selected Segment*

With groups, it is all of us. And also, the same thing holds.. It is high end information that we sending out to customers, the impression that we have is that a lot of our customers don't have the skills in the things we are giving them. The message we got, they didn't want to see us as a NZ company, when they are talking as us they like to see us in the at least in the same town, if not the same country. And we said with electronic media, whether we are 30 km away from you or 2000 km away, it doesn't matter a hill of beans. If you are transferring electronically, with text flying all the entries and things, like excel. Drawing files, a lot of our customers while they profess to be quite capable aren't. So the conclusion I draw from that is that I think we are quite sophisticated in our use of email.

*Interviewer, Segment 24**End of group*

Is that something to become complacent about.

*Interviewer, Segment 34***** Beginning of in Context Group*

You don't have to name names.

*Interviewee, Segment 35 **Selected Segment*

There are people within the place, there limit would be, everything comes to you in upper case, I don't take any offence with that, it saves them having to worry about full stops

capitals and that, they just leave everything in upper case all of the time. Other guys, the messages are all very short and you wonder how comfortable they are with it as a means of communicating. Interesting too you quite often see spelling errors, and I think it's just people, ..my spelling is not that shit hot but it's not through inability to spell it's just my fingers get in the way, my typing ability.. but it doesn't matter transposing, you see it all the time but the message is still there and no one would have.... [phone rings] ... there would either be a very brief message by their email or there'll be a great big dissertation with that much content in it that you want to keep that probably you want to keep that information. If you have got that much information and it's that important that you have done that much .. put together that much information you probably want to keep it so you probably would have been better off, doing it as a Word document, naming it, attaching it, and sending it, that we you have got your file retention. Because by and by, your mail you read it and then bin it, so I do worry when I see great big dissertations like that because invariably what I end up doing is keeping those in my recycle bin, whereas what I should do with it is pick them out, save them, retain them myself under my file management, so I do worry a bit about that. And the other thing too is the doc1's, people come to you doc1's and what are those guys doing. And the guy has sent through a three line Word document as an attachment.

*Interviewer, Segment 36**End of group*

Do these things get discussed?

This interaction comparison shows that I was able to improve the process of 'extracting' evidence from the participants without unnecessary structure or 'leading' questions. The interviewer in the first set of interactions was the designer of the structured questionnaire that we used throughout this research cycle. What this also shows is that while the first

round of interviews can be useful for a context or cultural comparison, to create genuinely grounded theory I must generate it from the least influenced evidence in the first instance.

A summary representing the data that is discussed in this section is presented in Table 11 as word counts. This table represents the formal {recorded and accurately transcribed} interviews that were conducted at CHH and the Prior Cycle {Tertiary Education provider}.

Table 11 - Word Counts of Transcribed Interviews

	CHH	Prior Cycle
Respondent	22430	36056
exclusive	3355	6149
different	5279	8959
Interviewer	10169	16129
exclusive	1429	2747
different	3350	5457
Respondent %	68.8%	69.1%
Means of all interviews in each cycle		
Respondent	2492	1717
exclusive	373	293
different	587	427
Interviewer	1130	768
exclusive	159	131
different	372	260

The ratio of interviewer to interviewee seems remarkably close, with the interviewee dominating the conversation 70 % of the time. There were twice as many interviews in the Prior Cycle as the CHH cycles; however, the CHH interviews were longer, and as were discussed above, were less biased by predefined theoretical structure. Two interviews in the CHH cycle that were recorded were unable to be transcribed because of poor audio quality; however, the written notes and discernable audio segments were

also used in the further analysis of the results.

The ethnographic method also derives data from a continuous researcher involvement in the context, and I attended many meetings and informal interviews. An estimate of my on-site interaction with the participants in the CHH cycles would be 300 to 400 hours. Some of this time may have traditionally been thought of as being wasted; however, meeting with a research participant at their home, travelling a long distance in a car with the participants, chatting on email, or having lunch with them, all provided opportunities to triangulate their opinions. Some of the participants would only tell you what they truly thought when they were not in a business or research setting. In fact I was exposed to both ends of the organisational spectrum when I was outside of arranged activities, strategic and personal dialogue amongst the other participants, or with myself allowed me to anchor the work based data that I was collecting.

The results that follow take into account this broader context. Although there was a rigorous method to collect unbiased data, some bias may still exist, and this needs to be moderated by a solid understanding and interpretation of the context. This exploration of the context follows the general summary of the issues that were uncovered.

7.3 Summary Table

The results are presented firstly in a summary table for quick reference and then in the

following sections expanded into the major issues that arose including a discussion of the key evidence. To reiterate, in a quest for accordance to the Principle of Abstraction and Generalisation (Klein and Myers, 1999:82) the presentation of the results represents the major concepts and findings firstly and other findings are presented in relation to these.

7.3.1 Quick Summary Results Table

A summary of the results of the major searches that were conducted are available in Appendix 1, whilst a distillation of these results are represented in the following table (Table 12).

Table 12 Summary of concepts derived from grounded theory generation.

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
Efficiency	Email is a very efficient form of communication that is fast. The speed with which you can communicate is dependent on who you are contacting and their behaviour rather than any technical dependency.	strong - supported by many participants
Communication Overheads	Simple email communication has very small overheads for those people that use a computer as part of their work.	strong - supported by many participants weak - supported by two

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
	<p>Non-compatible attachments are often ignored or deleted due to overhead of starting environment shell.</p> <p>Calendaring and automation have learning or usage overheads that some people do not want to tackle.</p>	<p>participants</p> <p>moderate - multiple uses of calendaring limited perceived efficacy</p>
Legitimacy	<p>Email has a range of social rules that govern interaction behaviour.</p>	<p>strong - evidence of specific breaches of legitimate use</p>
Distance	<p>Some standard business interaction can occur regardless of distance.</p> <p>However, there was some evidence of interaction constraint based on location and the ability to maintain social networks.</p>	<p>moderate - context included geographically distributed</p> <p>J.A.D. group that met face to face, whilst relationship with Australian clients was maintained.</p>
Decision Making	<p>Email allows for greater information gathering, but does not alter the traditional dynamic of business decisions and responsibilities falling on key members of staff.</p>	<p>strong -</p> <p>No participant perceived a difference in decision making process. Some participants conceded that information was easier to get from people.</p>
Asynchronous	<p>Email and other ACT's were considered to be both synchronous</p>	<p>strong -</p> <p>there was repeated evidence of</p>

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
	<p>and asynchronous depending on the use and the interaction audience. Whilst some people could be relied upon to answer immediately others could not. On an individual level email has the potential to be quite synchronous.</p> <p>Perceptions that document distribution systems could be maintained 'real time', and email is a very fast communication mechanism are mixed with comments that meetings could not be arranged on the day they fall because you couldn't get hold of everybody. These concepts relate to the group use of ACT's.</p>	<p>dyadic relationships occurring through email and the file system as synchronous interactions.</p> <p>moderate -</p> <p>there were several instances where file dissemination replaced synchronous communication. The authors of the documents became responsible for their time dependent accuracy.</p>
<p>Attachments</p>	<p>Attachments seem to be a considered to be a significant contribution to group decision making. The distribution of</p>	<p>strong -</p> <p>attachments were used extensively by individuals as they could communicate in the</p>

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
	<p>decision making resources was more important than discussion about them using ACT. In fact there repeated behaviour of using email to send an attachment and then using the phone to talk about it.</p>	<p>same way internally and externally.</p>
<p>Control, responsibility, and confrontation</p>	<p>There was evidence that email was perceived to be a nuisance to the prioritising process, in that managers or operations staff would be engaged in activity and along would come an email that would distract them.</p> <p>One interpretation of this issue is that people try to avoid conflict by emailing a negotiable task hoping that the person completes without question. However, with the level of aggravation that was related to this practice, it could be suggested that conflict is postponed rather</p>	<p>strong - management dialogue at the beginning of the project was triangulated from a number of sources to identify this as a real issue.</p>

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
Genre	<p>than avoided.</p> <p>Email was used as a replacement for junk fax, faxed technical drawings, memo writing, technical documentation, telephone conversations, and face to face, one to one and group interactions.</p> <p>Other ACT's were used to replace diaries, filing systems, and distribution mechanisms.</p>	<p>strong -</p> <p>most participants identified email as replacing a certain 'other' media.</p>
Media Richness	<p>Email filled a wide range of richness categories dependent on its application. However, some difference existed between specific uses of email and other available channels. In some specific cases the telephone was preferred, in others a face to face meeting was arranged.</p>	<p>strong -</p> <p>specific comments have generated this category; however, interpretations of use and behaviour have supported these concepts.</p>

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
Adoption	Synchronous adoption of ACT's by 'desk jockeys' was prominent; however, age was not seen as a determining factor. Operations staff that were continually involved in physical processes would only adopt use asynchronously, and with long time differences.	moderate - although a large number of behaviours conformed to this model, there were individuals that did not fit. Adoption in some ways seemed unpredictable.
Change	Some participants suggested that email has not changed anything; however, reduction in ancillary staff, middle management, clerical, secretarial, and bookkeeping type roles has meant that email, word processing, and organisational packages have been needed to fill in the gaps already created. A very important question that cannot be answered from this study is the matter of whether either of these caused the other.	moderate - all participants commented that any change that email had made, if it had made any at all, was incremental. Technical aspects of the change were remembered, but specific social change was not significant.

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
Document Handling	<p>The efficient storing, sorting, quality checking, and dissemination of information and documents was a legitimate exercise and worth investigation to improve the current process.</p> <p>The organisation of discussion and opinion was not considered to be a legitimate improvement initiative.</p>	<p>strong -</p> <p>most of the participants valued efficiency and rationality over dialogue</p>
Recorded	<p>The perception that email is recorded is strong. However, some individuals had a habit of keeping old email while others were not inclined to keep any old emails.</p> <p>The ability to organise folders and file management of email was associated with peoples general abilities to use computers.</p>	<p>moderate</p> <p>weak - coherent individual perception</p>

Issue Name	Description	Support
Autonomy	A very technical position that requires continued reference to incrementally released information can gain some autonomy and confidence through interaction with peers using ACT's.	weak - coherent individual perception
Variable Social Presence	Email supports a variety of social presence arrangements. The telephone and written communication can be replaced with email communication to an acceptable equivalence.	moderate to strong consistent evidence from accounts and observation
Visibility vs accessibility	There was a perception that visibility of networked items should relate to accessibility.	weak - coherent individual perceptions
Compatibility and change	The relationship between using email and competitive advantage is tied to the question of compatibility between members of the business value chain. Incompatibility in general software products was associated with the compatibility of email communication.	weak - coherent individual perception and observation of behaviour patterns

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
Concept completeness	A perceived difference between face to face meetings and email communication is that you can form a complete contestable statement on email and offer it as such, whilst in a face to face environment the proposer needs to be more careful.	weak - coherent individual perception
Supports existing distributed business environment	Although email was not thought to have created geographically distributed organisations, nor that the advent of geographically distributed organisations cause the creation of email, email was thought to support the communication tasks involved in this distributed relationship well.	moderate to strong - consistent accumulation of supporting fragments

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
Internal discussion process	<p>The overheads required to become accustomed to a new process of facilitating discussion, compared with the use of an existing communication arrangement were perceived to be significant.</p> <p>Individuals had to contemplate the process of changing the behaviour of other organisational members, and in most cases they chose the path of least resistance and used existing metaphors, rules, and norms, to undertake online discussion. Using email.</p>	<p>strong- result of intended intervention and feedback supported by personal accounts.</p>

Issue Name	Description	Support
Diplomacy and 'arse covering'.	<p>Email was used by participants to convey blunt orders, and for recrimination avoidance.</p> <p>From a context and historic perspective, these communication processes were undertaken using traditional methods {memorandum for internal, letter for external} before the advent of email.</p>	<p>moderate - several corresponding accounts</p>
Difficult cognitive process	<p>Email is more difficult to construct than face to face communication, which has a natural, or deeply ingrained, compositional process.</p>	<p>weak - coherent individual perception</p>
File dissemination legitimacy	<p>Where plain email was legitimated by past communication arrangements, other ACT's were legitimised by organisational processes and protocols. The Public Folder system specifically, was seen as being a highly appropriate and efficacious feature of the system, utilised solely for</p>	<p>strong - observed and described patterns of communication and personal accounts support this.</p>

<i>Issue Name</i>	<i>Description</i>	<i>Support</i>
	file management and dissemination.	

Table 12 along with supporting evidence from research notes and other interactions are combined in the remainder of this results chapter. The sections 7.4.1 *Autonomy*, 7.4.10 *System Development Processes and Communication*, and 7.5.5 *Document Handling*, do not relate to specific concepts described in Table 12, but are significant results that relate to other issues that arose in the course of the research that are described in Chapter 5.

7.4 Technological Democracy

The democratic design criteria of technology introduced in Chapter 1 were part of the collection of values that I had when I started this research. My choice of the PAR method and an ethnographic style allowed me to both discover the reality of ACT's in terms of democracy, but also to assist on balance to make the system more democratic. I did not overtly or covertly determine that I would undermine management nor force a new strategic or operational decision process on the participants; however, when I was asked for my opinion I relied on this value system to guide my answers. I am sure that this value set would have guided my behaviour in other ways that may have been far more subtle, but the intention of PAR is to make explicit these values, to explore them, and to reflect on them. In this research I had been led to believe through the prior research that email specifically had the potential of making systems more democratic, mostly by reducing social influence and status effect. The reflective analysis of email

and ACT's generally goes beyond this initial perception of the effect of email on a social system, taking the design criteria of section 1.2 and fully embracing the interpretive perspective that the technology is socially constructed, I can look at the behaviour of the communicators, the administrators of the system, the organisational members who were not communicators, the management staff, and the technicians that serviced the system locally and that had contact with the users. The result of this analysis, shown in Table 13, is that the system was not democratically constructed nor maintained.

Table 13 - Democracy of Technology Criteria [Sclove, 1995:98] analysis

Design Criteria	Description of Criteria
Toward democratic community	<i>Seek balance between communitarian/cooperative, individualised, and intercommunity technologies. Avoid technologies that establish authoritarian social relationships.</i>

Email did not appear to change existing communication patterns. Those relationships that existed previously, supported by the telephone or interdisciplinary process improvement groups, were supported using email. Email enabled faster and more efficient communication between participating individuals, which in turn may reduce the relative effectiveness of the communication between users and non users of the email facilities.

The public folder file system allowed privileged access to information; however, folder names were transparent to all users of email, therefore allowing visibility of structure or topic across many levels, functions, and business types

nationally.

Email and file sharing ACT's did not diminish authoritarian social relationships, and in some instances of operational floor staff, perpetuated them.

Toward
democratic work

Seek a diverse array of flexibly schedulable, self-actualizing technological practices. Avoid meaningless, debilitating, or otherwise autonomy-impairing technological practices.

The calendaring system within the office productivity package was an autonomy impairing technological practice.

The need for operations staff to leave their work at a regular time each day to read their email could be regarded as autonomy impairing; however, because they choose when to do this, they are creating a flexible schedule.

The internal file system (Public Folders) were potentially useful as discussion lists. Database replication delays would have exacerbated asynchronicity, if widespread implementation had been adopted, debilitating their use.

Other meaningless technological debilitating practices were evident, in that local system administration personnel had very limited control of the system, where control was handled centrally on a corporate level. The creation of users, email accounts, or access to certain servers were all tasks that the local technicians had to submit requests for. One comment by

a senior member of the staff that they “...used to buy the industry magazines but didn’t bother any more because they were not allowed to implement anything even if they did have a good idea” highlighted the frustration these staff coped with.

Toward
democratic
politics

Seek technologies that can help enable disadvantaged individuals and groups to participate fully in social and political life. Avoid technologies that support illegitimately hierarchical power relations between groups, organizations, or polities.

At the operational level, access to email was more difficult than at the operations management, facility management, R&D management, and upper management groups. At this level a difference existed, but one that was supported by the legitimacy of the task and operations of the organisation. However, the hierarchical power relationship between the corporate level and the facility level did seem to be ill-conceived and inhibit the normal functioning of the technicians and limit the service they could provide to the user group.

To help secure democratic self governance

Restrict the distribution of potentially adverse consequences (eg., environmental or social harms) to within the boundaries of local political jurisdictions.

Seek relative local economic self-reliance. Avoid technologies that promote dependency and loss of local autonomy.

Seek technologies (including an architecture of public space) compatible with globally aware, egalitarian political decentralization and federation.

The one piece of evidence that suggests an increase in local autonomy and any relationship to a public space is the use of usenet groups by the operations staff to maintain their industrial equipment software.

Local economic self reliance was evident at the business unit level, but not the facility level to the same extent. The SMU project was the result of the intention to create further enhancements of a matrix structure within a geographically dispersed strategic business unit. The technology was developed to integrate the separate SMU facilities rather than create facility autonomy.

The Public Folder system had the potential to become a worthwhile public space. However, limitations on the creation of folders and resources meant that it was administered in an authoritarian way rather than a democratic way.

To help perpetuate democratic social structures *Seek ecological sustainability. Avoid technologies that are ecologically destructive of human health, survival, and the perpetuation of democratic institutions.*
Seek local technological flexibility and global technological pluralism.

The organisation was not democratic, and the technology supported the perpetuation of existing non democratic institutionalised practices. Local technological flexibility was limited, and incompatibilities of software versions and operating systems limited technological pluralism.

According to Sclove's definition of a democratic technology, and a reflection of this particular instance of it, email has the potential to be very undemocratic. Given the nature of the centralised control at a corporate level, this instance may be an extreme example. However, having been involved in three academic institutions, and two business organisations, I recognise a high level of similarity in some aspects. Particularly that prepackaged generic office automation systems have a low level of interactivity at the user level to alter system level conditions. The creation of a public space is one aspect that becomes difficult with our existing tools, certainly we can create shared spaces on network drives and servers; however, under resource constraints and budgetary and security protocols there is a reluctance to make anything 'public'.

The attempt to train employees in the basic and advanced aspects of email illustrate an aspect of Metastructuring [Orlikowski et al, 1994] presented in Chapter 3 as:

the deliberate, organizationally-sanctioned intervention within the context of use which helps to adapt a new communication technology to that context, modifies the context as appropriate to accommodate use of the technology, and facilitates the ongoing usefulness of the technology over time.

This concept relies on the object / context distinction that was questioned in Chapter 2. Even without questioning the objectivity of technology, in this case it is the context that is being modified to accommodate the use of the technology, using training sessions etc., rather than the modification of the technology to suite the social context. Without attempting to separate the communication acts conducted over email from the formation, implementation, and maintenance of the technological system that we call email, even with this softening of the previous analysis, from this evidence it is suggested that email is undemocratic in a centrally administered form of implementation. However, some aspects of communication should be analysed separately, as access to communication can allow for employee access to decision making participation (Harrison, 1994:259) and general change process (Ford and Ford, 1995:542). The following sections 7.4.1 to 7.4.10 explore specific evidence that was uncovered in the analysis of the results, each of which contributed toward the meta analysis of Technological Democracy by outlining a significant characteristic of communication within the context.

7.4.1 Legitimacy

Email seemed to have a range of social rules that govern interaction behaviour.

Participants were not always aware of general Internet etiquette; however, some participants knew that typing in UPPER-CASE was the equivalent of shouting, and many participants included emoticons, such as a simple text character smiley :)

Legitimised interaction behaviours were more evident in conflict that arose, than in the smooth running of the everyday communication. Individuals that made specific task requests through email, without prior negotiation were considered to be rude, a concept presented separately below. However, a representative sample of these social roles, shows that message length was an important attribute of email, whilst correct spelling was not:

Interesting too you quite often see spelling errors, and I think it is just people,.. my spelling is not shit hot but it's not through inability to spell it's just my fingers get in the way, my typing ability.. but it doesn't matter transposing, you see it all the time but the message is still there, - and no one would have [phone rings] ... there would either be a very brief message by their email or there would be this great big dissertation with that much content in it that you want to keep that probably you want to keep that information If you have got that much information and it's that important that you have done that much.. put together that much information you probably want to keep it so you probably would have been better of doing it as a Word document, naming it, attaching it, and sending it, that way you

have got your file retention. Because by and by, your mail you read it and then bin it, so I do worry when I see great big dissertations like that because invariably what I end up doing is keeping those in the recycle bin, whereas what I should do with it is pick them out, save them, retain them myself under my file management, so I do wary a bit about that. Dave -

CHHP

In this case, the reference to "great big dissertations" was tied with an inappropriate choice of message carrier. The Outlook™ mail client has facilities for storing messages in local folders; however this participant would have preferred the message to be sent in a pre-formatted proprietary word processed file and correctly labelled to make it easier to file. Specifically, this participant also complained about people that do exactly this, but not correctly naming the resultant files, and ending up with "... doc1's, and what are those guys doing! And the guy has sent through a three line Word document as an attachment". In relation to the previous quote by Dave is the ability of the individual to type quickly and accurately. In an interview in the Prior Cycle, one participant felt that his communication was inhibited by his typing speed, and at CHHP there were several participants that related their ability to type to a speech impediment.

Because of the recognised differences in individuals of ability and access, a wide range of personal scheduling of access to email was considered to be legitimised by the type of work that the individual undertook. In several cases individuals that did not respond

promptly, yet had ongoing access to a desktop machine, were considered to be performing poorly, while individuals that were often mobile or on the factory floor could establish any access patterns that they preferred without being considered derelict in their duties. However, a routine of access was considered a more legitimate behaviour than an ad hoc behaviour.

7.4.2 Communication Overheads

Simple email communication has very small overheads for those people that use a computer as part of their work. Direct comparisons were made to a fax machine for conveying documentation, and a telephone for the task of contacting an individual. Email was said to be more efficient in each of these comparisons.

Non-compatible attachments or email that is not plainly purposeful is often ignored or casually deleted without ensuring that it is important to the person. However, the statements that created this preception may have been a local falsification, or explanatory story, in order to be able to be less directly connected to administrative control. When another member of the team was questioned about the compatibility of the technology, they mentioned.

Paul: No, they are all on mail now, they are all on outlook now, they have softwindows

Robert: That's the problem, they said they don't bother using it, it's too slow

Paul: Oh, I don't know! They seem to get all the jokes.

For some people there is no onus for response or memory with some forms of email communication, whereas other people will keep a copy of all of their correspondence. Some participants had almost every email they had received, stored in an accessible location. In the training sessions there was a desire by a minority to use automatic rules to filter out any email that containing *FYI*, or any email that contained “.. *The temperature of the factory today is ..*” as they were not interested in the managers daily factory update.

Calendaring and automation have learning and usage overheads that some people do not want to tackle. Some people were reported to keep a paper diary with a printout of their electronic diary inserted for the current week. Whereas other individuals did not keep their electronic diary up to date, preferring to use their paper diary or electronic personal organiser.

Likewise, structured groups for the discussion of the training sessions, NPD process, or discussion of SMU groups were all shelved after unsuccessful attempts. Similarly, Kock reported that;

..the EC-supported BPI efforts were seen by some middle managers as

“... a waste of time, resources, and patience...”, as one of them put it.

Interestingly, these managers apparently shared some common personal characteristics. They were mostly “field” people, in the jargon used at Govern, in the sense that they were typically involved in the direct execution or coordination of outdoor activities. They were also generally negative towards the use of computer technology, except for data management ...

[Kock, 1997: 222]

Adding to these two environments, is the context I face within my own university, where we have tools for conducting structured asynchronous communication. The students use these tools for course assessments; however, attempts to use these same technologies (web enabled) for staff discussions have had poor adoption. With the significant differences in culture that you might expect between a highly technological manufacturing company with facilities in three countries, an agricultural research centre, and a faculty of business, you might also expect significant differences to the perceptions of utility of the technology; however, on completion of this research project I found more similarity than difference.

7.4.3 Distance and the Distributed Business Environment

Some standard business interaction did occur regardless of distance. However, there was some evidence of interaction constrained based on location and the ability to maintain social networks.

Well, yes and no. Back in the early 90's I had a lot of dealings with people in Australia, outside of the organisation, frequently we would get stuck with things we had done through telephone conversations, but not backed up in writing and when it came it down to the crunch the likes of who did what and what happened blah blah blah it was very difficult to track, and not just from me but from other people as well. But with email it is far more easier rather than just ring someone to actually send them an email with a copy to people that need to know and basically keep everybody in the loop. The only thing I found about email though, in that article that I just gave you it had it in there, you need to be very careful about the way you word emails and you need to make sure you make personal contact every now and again, and just shoot the breeze. Because otherwise email is a good way of communicating and getting information, but it's not necessarily full suite communication. Paul - CHHp

This message was reinforced several times, and there was also some evidence to suggest that the asynchronicity of the interaction was efficacious.

We are communicating more now though with the sales guys in Australia, we have more to do with them, we were pretty local but now we are starting to move more, sending stuff out to Australia and have more to do with them. And it's easier, rather than ringing Australia, just email those

sales guys, with the time zones etc. And you've got a record of what you've told them and what they've told you. Melanie CHHp

There was also some rhetoric to utilise electronic infrastructure for mediating distance interactions:

Yeah, I mean, the process of developing the process could have been done a lot more efficiently in that we were spread out between here and Hastings, there were two or three representatives here and then the team at Hastings, effectively the meetings didn't need to be more than two or three hours, they became drawn out because we made a day trip out of it to Hastings or they made a day trip out of it to us, that was a problem. That took out a full day out of anybody going from Hamilton's time or anyone coming from Hastings. And I seriously don't think that anybody has got that time to throw away at the moment. The actual... I would to have employed more of a virtual meeting like format, and I am sure there are tools that can be used, I've heard people talk about chat rooms on the Internet and that sort of thing, and I don't really know what they are, but it sounds to me like everybody dials into it and just talks away, and the dialogue of what comes at the end of it becomes the meeting minutes. Something like that I would really like to investigate because being such a spread out group that we are it would have quite wide ranging effect right across the group and maybe

video conferencing but in a corporate network like it is, it is very important that you have documented records and having email records is the better way to go. I guess you could also have a video tape of a conference as well.

Paul CHHp

However, this view was in the minority. This individual wanted to experiment with distance communication technologies, but neither of us could convince the majority to be engaged in the activities that we constructed.

7.4.4 Decision Making

Much has been said about email and decision making in the literature, surprisingly, very little association was drawn by the participants in either cycles of this research to email and decision making. At CHHp email was said to improve the information gathering in the decision process, otherwise, the decision process was unchanged. The organisation was not said to be more democratic; however, some individuals did perceive that they were involved in contributing more information to decision making. Most participants that made specific comments about decision making and email were quite adamant that it did not change the decision making process at all.

No I don't think there has been any change. The way I see it, email is only a tool to provide information it's not really going to change the way you have to decide things. You still need to look at all the information .. a big

part of making the best decision. Mike - CHHp.

It was only with a little digging that they owned up to being able to get more information through email.

Robert: whether you think it affected your... the way that you did your job or your decision making specifically using email. Do you think that email has changed your decision processes individually?

Tim: Not my decision processes, because I still prefer to have all of the inputs that I need before I make a decision. I use it as a tool to get some inputs when I know... it takes out a delay factor you can use timing to your advantage by having a message with someone who knows the way... and comes back. But I don't rely on it to do all of the work in that sense in that sense because there is a danger that you will lose time.

However, it was also clear that gaining consensus through email was not easy:

... and so everyone can be watching this ping pong going back until they see an opportunity when they need to step in and say something, and then they will come into the network as well, into the discussion. It makes for

quite interesting reading if you print it all off, but unfortunately it doesn't seem to be a good way, it doesn't seem to be a very effective way of drawing things to a decision yet. You always get the point though where you need to ring the person concerned and talk it through with them rather than trying to do it on email. It is quite easy to just flick back another comment and it flicks back again. Paul - CHHp

And with regard to status effect minimisation, most participants did not see a difference between physical meetings and ad hoc email groups, or found the comparison difficult, while one person saw there was a subtle differences:

Melanie: I think that they would have been made, but in a different manner, possibly longer, possibly with a little more influence from one person than another, but then it's same again if someone doesn't feel strongly enough to reply

Robert: So it hasn't changed the fact that someone might dominate the decision?

Melanie: Not really, some things yeah, ... a meeting people point of view where you have one person that will talk a group of people down, this way you can have more than... you get the immediate feedback, people don't seem to feel quite so threatened about presenting their ideas.

7.4.5 Asynchronous

Email and other ACT's were considered to be both synchronous and asynchronous depending on the use and the interaction audience. Whilst some people could be relied upon to answer immediately others could not.

Perceptions that document distribution systems could be maintained 'real time', and email is a very fast communication mechanism are mixed with comments that meetings could not be arranged on the day they fall because you couldn't get hold of everybody.

Email was often considered to have a synchronous characteristic, but only in consideration of dyadic relationships. Communication with groups were normally considered to be slower using email, because of the uncertainty of the combinations of response rates. Most participants considered group communication using email to be asynchronous. The legitimate group communication pattern reinforces this perception, in that a single person is asked for a response, but the group remains connected and able to interrupt if they have something important to say, in that;

...someone will start off, and they will just send out a note to everybody, ... and so the person that receives it, the person it was directed at will click on the 'reply to all button', and they send back their response, and so everyone can be watching this ping pong back until they see an opportunity when they need to step in and say something, and then they will come into the network as well, into the discussion. .. but unfortunately it

doesn't seem to be... a very effective way of drawing things to a decision yet.

You always get the point though where you need to ring the person concerned and talk it through with them rather than trying to do it on email.

In this way the organisational members are able to communicate with the group but at the speed of response of the one person. If anyone else wants to interject they must do it before the first person responds.

It is likely that the lack of legitimacy of the public folders discussion was due to the differentiated communication pattern that had to be followed in order to engage in communication with other parties. Some members of the organisation were familiar with this type of communication pattern, as they communicated on Internet news groups; however, a significant number of these individuals used Unix workstations and did not have access to the public folder system, and therefore, were not exposed to the opportunity to discuss.

The transition to a differentiated communication pattern is not likely unless more of the employees appropriate these particular communication genre through interaction in communities, such as on the Internet, where these styles are predominant. The third level of legitimacy is referential to a differentiated body of knowledge, to gain a high order of legitimacy the employees not only must be exposed to these new styles of communicating, but the language of discussing these forums needs to become the

organisations vernacular, and this happens slowly.

7.4.6 Attachments

Attachments seem to be a considered to be a significant contribution to group decision making and general communication tasks. The distribution of information encoded in files and other decision making resources was important to many of the participants, and seemed to be seamlessly added to the functionality of email. In fact there were repeated incidents of using email to send an attachment and then using the phone to talk about it rather than then use an email reply. Even with the ability to use a public folder to allow accessibility to a number of colleagues in an efficient manner (something that would have been highly legitimate in this cultural setting) the participants still preferred to email the attachments.

7.4.7 Control, Responsibility, and Confrontation

There was evidence that email was perceived to be a nuisance to the prioritising process, in that managers would be engaged in activity and along would come an email that would distract them. The evidence was mixed among the layers of the organisation. The executive managers at the inception of the project felt that this was a significant problem, but the line managers had very little complaint with email as a distraction. One incident that was important in moderating this concept was in attempting to contact a number of the line managers. In the first instance I used the telephone to contact the managers, on numerous occasions this failed to get a response (from synchronous or asynchronous

communication); however, email was invariably successful in obtaining a prompt reply. A response that I got from one manager was that he was trying to get some work completed and he didn't want the office staff to know that he was in his office. His telephone traffic was observable to the office staff, whilst his email traffic was opaque.

Email was likewise used to avoid direct confrontation. In two instances participants admitted to disliking the behaviour of some of the other staff, where they send an email rather than do the work themselves, at the same time as recognising an occasional similarity in their own behaviour.

The term 'Arse covering' was used by more than one participant to reflect behaviour using email that was appropriated from previous Memo and Letter writing behaviours. Where a person expected some 'fallout' from a telephone conversation they would usually write a memo confirming the conversation and the negotiated outcome and send a copy to another person that would usually be in a position of authority or control. The participants recognised that this behaviour was replicated using email, in situations of conflict, an email may be copied 'CC' to another person.

A separate but associated issue was the general risk of 'CC' copying, and forwarding Email whilst leaving the preceding conversation *thread*³² intact. Some staff members conveyed a strong feeling that it was both useful and risky to keep a *thread* intact. It was

³²A 'thread' is the previous ongoing conversation. A 'thread' is usually delimited into authored chunks and may take on an order (top to bottom) according to the mail client.

useful in that you could understand the latest addition to the *thread* as the remainder was accessible below, but also dangerous as there could be many views portrayed in a very long thread, and if the *thread* made its' way back to a customer after having done the rounds in the organisation there could be content that disconfirms the official message, or embarrasses the company because of put downs or profanity.

7.4.8 Autonomy

An individual in a very technical position required continued reference to incrementally released information gained some autonomy and confidence through interaction with peers using ACT's. The efficacy and use of Internet news groups was tied to individual problem solving of a technical nature. Where the discussion list type of interaction had very little legitimacy inside the organisation, externally with a differentiated community it was totally acceptable.

Many instances reinforce elements of the technological structure / infrastructure / management that inhibited self governing practices. Some examples include:

- I. the inability of many staff members to use Email in operational roles, or indeed being forced to use Email and not having appropriate access to it,
- II. staff not having the knowledge to be able to send Email outside of the organisation,
- III. staff not having a local address book set up on their computers, not knowing that they could or how to do this, and wasting time by repeatedly typing addresses etc.

- IV. reluctance of system administrators to make network changes and delays in setting up Email accounts and network resources etc. due to off site management.

It would seem that autonomy was impaired through centralised corporate control and insufficient dissemination of knowledge about the things that they could do.

Organisational members were sometimes coerced into using the calendaring tools within the Email client. Many participants avoided using these tools because they were not compatible with existing habits or technologies. Some participants had a habit of carrying a standard printed diary, and the electronic calendaring system was not a legitimate alternative for this particular technology. It was noted by one participant that a number of organisational members would use both technologies and before a meeting or as part of a routine they would print off contents of the electronic calendar and insert these loose leaf pages into their diary.

Some organisational members used Portable Digital Assistants (PDA's) and in many cases these were incompatible with the calendaring tools, and if compatible the functionality was not complete.

7.4.9 Visibility and Accessibility

Both the email system and the folder system were installed and integrated at the corporate level. Some of the participants complained about the visibility of network

components without necessary access, ie. the participants could see the folder names of remote facilities but had no access to the documents that would have been contained in the folder. However, some participants also found it interesting to wander through the remote file system structure of quite different business units to determine what sort of issues were being documented.

7.4.10 System Development Processes and Communication

Involvement by users in the system development process is often seen as beneficial and email could be one way to increase the link of users into the systems development process. However, in one meeting that I had with two system developers, and a separate statement from a formal interview from a third person in production management, there still seems to be a reluctance to involve these other users. The two developers, when asked whether the account managers would be involved in the system development process, said "*probably not, they don't seem to want to give us the time*", which in itself is not detrimental to this process but after digging deeper I asked them whether they had been involved in past development projects, and they hadn't, and I asked about the success of the previous projects, and the answer was "*..no, they haven't really used anything that we have built for them.*". The statement from a production manager relates to this dynamic in that he said "*..I think that the account managers still tend to run a little bit isolated from the real world. It is going to get forced onto them by our NPD system in that it is driven by their inputs and they're locked into the system. They have been able to ignore using the system to date.*". Without the input from this user group

it is questionable whether the imposition of a system is going to be a success. The developers, the production management, and the account managers could have communicated using email but the social groupings and existing dynamics of social communication made such a process unlikely.

7.5 Media Genre

There was reasonably strong evidence to suggest that email is used for multiple discernable purposes and 'Genre' are appropriated based on past social interactions and recognisable 'office' technologies. From an Human Computer Interaction (HCI) perspective, iconisation of some aspects of ACT's may hold the clue as to why some people would appropriate a filing cabinet as the mode with which they use an electronic space, which, although can be used for moderated discussions and opinion sharing do not mix with the appropriated form of interaction based on preconceived notions of purpose. Having a 'discussion' inside a folder or inside a 'filing cabinet' seems ludicrous in the physical world, and although this concept was not overtly stated, the use of the public folders systems would suggest that the appropriation of 'centralised information storage and retrieval system' was a powerful defining force in creating purpose for the use of this public space. The users did not afford a discussion activity with the symbols used in the interface.

A predominant decision making process was the *Cocktail party discussion mode* where three, to six or more, people would send spontaneous group emails to each other, but

directed to someone in the group whilst the other members of the group would receive a copy. The onus for response was on the person to whom the email was primarily sent, whilst others could also chip in with a comment when they had something to contribute. This process allowed a decision to be formulated and made with a close group of people gaining transparency and involvement. This form of social interaction was ad hoc, but with some routine cocktail party goers, and a definite protocol for interaction.

7.5.1 ACT's as an Efficient Infrastructure

Email was seen as being a very efficient form of communication, that was fast. The speed with which you can communicate was seen as being dependent on who you were contacting and their behaviour rather than any technical dependency. In this context there have never been any significant problems with the system and this perception may have been different had the system had more down time.

One respondent reflected on the change between an internal only system and the broader corporate rollout of extended functionality.

The net that we have set up at Carter Holt in place for 2 to 3 years. Prior to that there were a very small number of people with access to email, probably 20 to 30 within the company [plastics division] I don't think it was well utilised. In and around that time it became apparent that it [email] was an excellent tool and that ... That gave us really an internal email system, but

it didn't have any external linkages. And that was wonderful for internals, but it became limiting .. People would say are you on email and you'd have to say no I'm not, a pain in the backside because you'd have to rely on phone calls and faxes. Dave CHHp

This respondent was not aware that the previous system was capable of outside communication, this functionality was not promoted until the later rollout. However, this reflection shows either an accurate portrayal of the limitations felt at the time, or a picture that had been created since the fuller functionality of email had been incorporated into the business processes.

All of the participants considered email to be a valuable tool that allowed them to reduce the turnaround in getting information or in resolving problems. Dave in the previous text segment was relating this experience to both customers and suppliers. This concept has been confirmed by others, and by observed behaviour.

Yeah, it's no good having all this if it is an internal tool. It's good... but that doesn't give us the full leverage does it. When I get frustrated when I here - we haven't got email, and they're behind the times. And I'm sure in six months time there will be something else that we have got, or they've got or we haven't got or whatever it is and we'll be saying we need that. I should say, we don't need it, but the advantage may be this this and this. And I

believe real time communication is an advantage, it reduces all lead times or means of trends. Whether it is getting a proforma invoice out to the airport for a rush job to get out .. put that on a fax .. and you've got a guy that's got a problem and you lean on him and say have you got a problem. reply.. You just type their name and that's it.. backwards and forwards. And in a couple of minutes it's done. Glenn CHHp

In this case Glenn refers to ACT's as being "real time" and Ruth who dealt with customer enquiries into accounts and with other administration issues was adamant that email was equally useful for getting in contact with people, but did not necessarily make the communication about paper documents any easier.

And also, when I rang up a lot of people they had their answer machines on. So you didn't get too good a response, and it takes longer. I found that a lot of people read their mail and answered it, quickly.

.....I also found that I can send something off to the guys that I couldn't answer the question or wanted further information on, I found it was easier to present them with a piece of paper on their desk ... Ruth CHHp

7.5.2 Media Richness and Variable Social Presence

A mixture of responses suggested that email is not “*full suite*” communication, in that it does not handle the full set of interpersonal interactions that we are capable of; however, some participants suggested that after using email for some time it was more like a conversation. This range of responses mirrors the indecision that is prevalent in the media richness theory which would tend to suggest that the natural use of email in an organisation is subject to some of the same unknown influences that have confounded experimental researchers. One answer to this problem may be constructed from the previous section ‘Genre’ in that email may not actually be a media, rather it is an infrastructure on which media may operate. One specific statement by a participant triggered this avenue of thought “*it can be formal or informal - it is totally flexible*”. Discussion of media richness and genre will take place in the discussion section based on the concept that, like paper, email itself is not a media.

7.5.3 Adoption

Overt statements would suggest that predicting adoption of email based on age or education could be difficult. There were examples where someone who had gone through secondary school in recent times and had the chance to study computers chose not to. This person was a female engineer who specifically didn’t want to end up in a; data entry, wordprocessor, or secretarial role, and perceived an association with the available Information Technology classes. On the other hand some people with no exposure to I.T. in general at school, who were quite advanced in their careers when

personal computers and email etc. were introduced into the company were said to be expert users of the technology by their peers.

In general it was thought that those people that had a generally positive attitude to computers would succeed and enjoy email use. The adoption *decision* was often not actually a decision. Some people commented that the computer was 'plonked' on their desk and they then had an expectation that they must then use it. Use of email and other organisation wide systems seems to create a defacto legitimising act. Individuals that are reluctant to learn or to adopt may seek out opinions of contradiction of others amongst their peers, but the statements that were collected supported adoption by rule and resistance by persuasion. Critical mass was also not clear cut. If critical mass was a phenomena that could be used to predict the adoption of a communication technology then this would suggest that when the email system was only local there would have been less adoption than when the system became integrated with the external corporate, and when more employees received personal computers. In one respect the critical mass 's' curve of diffusion did have a certain repercussion. Of the users that had access to the local system before the external system, most were appreciative of the transition from local to global. However, the decision of the internal only users, and the later 'adopters' was determined more by resource constraints and the business and technology plan than by the adoption decision based on perceived benefit. Of the two individuals that refused to use the communication system initially, neither changed their decision after the later rollout of more users and better accessibility.

7.5.4 Compatibility and Change

Some participants suggested that email had not changed anything; however, reduction in ancillary staff, middle management, clerical, secretarial, and bookkeeping type roles has meant that email, word processing, and organisational packages have been needed to fill in the gaps already created.

The changes in the email system from Microsoft MSMail™ to Microsoft Outlook™ were not considered to be consequential. All staff considered the transition to regular use of email and ACT's, in their daily routine, to be a very slow process. No participants could remember a significant event that changed the way they used email, other than the rollout in 1996 of the corporate wide email system that added a large number of users at one time.

Change and compatibility were considered to be mutually exclusive concepts. A corporate wide software freeze after the installation of Window 95 and office 95 meant that there was a small degree of incompatibility with some customers, contractors, and suppliers for a short time. However, most participants recognised the need to manage change in order to increase internal compatibility and external consistency. The incompatibility with customers, contractors, and suppliers went both ways rather than simply falling behind. One participant believed that they were quite a bit more sophisticated than some of their customers in utilising the software tools available.

7.5.5 Document Handling

The efficient storing, sorting, quality checking, and dissemination of information and documents was a legitimate exercise and worth investigation to improve the current process. The organisation of discussion and opinion was not considered to be a legitimate improvement initiative.

Ever since Lotus produced its Notes system the ability to integrate communication and document management has been available. Outlook gives the user access to Public Folders and networked resources through easily accessible shortcuts; however, these additional resources do not activate notifications in the same way that an incoming email does. Even after training, one participant had to send an email to his peers to remind them that there was information placed on the Public Folders.

For spontaneous group involvement and decision making, attached files were the most common method to share complex information.

7.5.6 Recorded Communication

The nature of email as a recorded form of communication was variable. Some people kept accessible and manageable message organisation while others kept a single mailbox and deleted anything they "*didn't like the look of*".

7.6 Summary of Results

In this chapter theory was presented that was derived from participant accounts and explained through hermeneutic analysis. The categories of concepts that were emergent were derived from broad searches of common *active* words and phrases and the subsequent manual processing of the contextualised output. The major concepts that were generated are summarised in Table 12, and so the reader is referred to this resource to gain an insight into some of the issues that were prominent in this participant group.

Some concepts were derived from the significant events in the field, and in these cases the reader can refer back to Chapter 5 for a deeper description of the organisational context within which these events took place. Chapter 5 also provides some type of result from the research as well, as the Action Research method that was employed can only be refined with an appreciation of the organisational change that was attempted in this project.

The last word here; however, from a highly involved perspective, and from the Ethnographic perspective of Serendipity (page 195), the three things that have a strong impression on me are;

- ☒ The users did not show much, if any, interest in using group moderating processes. They preferred to use what were mainly dyadic processes modified for group interaction. Asynchronous discussion was normally conducted in *cocktail party* mode, where an individual would *talk* with one individual and *cc* the other members of the discussion group. The receiver was the individual that had an onus on response, but the other members could *chip in*.
- ☒ Email specifically, but network file storage as well, was not always considered

to be asynchronous. Terms like '*real time*' and '*now*' predominated discussion about the communication technologies employed. However, this perception was only apparent in dyadic relationships, group communication invariably were treated as *very* asynchronous.

- ☒ Decision making was not changed significantly by the use of automatic and efficient computer implemented communication technology.

The following chapter attempts a conclusion of the whole project, including the results, followed then by a Discussion and Future Research chapter.

8 Conclusion

We have suggested that such tacit emergence of genre norms typically occurs when people are confronted with a new condition (such as a new communication medium) and, in the absence of explicit guidance about how to deal with it, simply transfer existing norms and established habits from a familiar situation to the new one [Yates, Orlikowski, and Okamura, 1995:357]

8.1 Summary of the Project

This thesis began with a statement that the literature had suggested great promise for email. If I had believed everything that I read then I would suspect that email and related ACT's would change the face of the planet. McLuhan (1988) once said that we are no longer passengers of spaceship earth, we are now its crew, and I felt that the structural influence of business organisations played a significant part in determining our future and

the future of the planet. As communication was such a significant part of determining change and the strategy of an organisation I wanted to study communication from an IS perspective to try to predict if technology could help us in our quest for sustainability, justice, and freedom. An ideology of democracy was made explicit and a research method that had proven to hold democratic ideals and enable research into democratic process was used to study these ACT's. The research participants were encouraged overtly and covertly to direct the process and topic of the research.

8.2 Results

This research found that email was used for many purposes and was seen as a very effective form of communication. However, email was not found to change the decision making behaviour of the participants. Forcing the participants to reflect more deeply about this issue some of them conceded that email allowed more freedom and access to information from other staff at the initial stages of the decision making process and to allow for mediation at the end to gain buy in.

Email occupied such a variety of uses that explanations were sought that could explain the ability of individuals to comprehend unwritten intentions and behaviours. It was found that email occupied many media spaces, and these can be thought of as media genre [Yates and Orlikowski, 1992]. Rather than change the way we interact, as was first thought on the initiation of this research project, email and other ACT's may simply be

more convenient, faster, and more efficient than other forms of communication that the participants had access to.

The technological tools that were employed may have the potential for changing social dynamics over a long period of time. However, using a framework for analysing democratic technology these tools were shown to be undemocratic in their; construction, administration, and use, therefore suggesting that a democratic end may not be in sight.

The dual nature of the Action Research methodology used within this research project meant that the evaluation of the implementation of the method was important for repeatability. The next section outlines a summation of how the Participatory style of AR undertaken has relevance to IS practice.

8.3 Organisational Interaction and Action Research

My intentions for undertaking this research were summarised in Figure 7, and although a little confusing this is a thorough amalgamation of the various organisational and research dynamics that were envisioned in the research project. However, the deep organisational immersion that was experienced meant that the intricacy of this model made it impossible to follow. The deep immersion that is likely to eventuate in a project such as this is probably more suited to a collection of maxims and personal guidance rather than a highly structured plan. Thereby lies the first suggested maxim for this type

of research;

I would advise to have a mentor for this type of project with a similar philosophical mind-set.

Participatory Action Research was used in order to develop a general theory of ACT's without prejudice from existing academic structures or theory. Reflecting on this issue raised some minor issues to do with academic influence in the workplace, where individuals within their work setting were exposed to academic theory through trade journals or as it was reported in periodicals. The *texts* of influence suggest that even in grounded theory there is natural academic influence, and it is interesting to note that the only explicit support of the media richness theory came from the influence of an academic *text*. On further reflection this issue questions my insulation of the workplace from academic influence.

My incorporation of principles of ethnography to generate grounded theory meant that I was controlling my influence to within the bounds of legitimate organisational interaction. I believe that the resultant hybrid of PAR and ethnography produced a pragmatic research method with a good deal of utility in this case; however, this may not always be the case. I also believe that this research project took much longer than was required, had I had access to more specific support for the method I think I would have been more efficient. I can place my naivety in the context of the mid to late 1990's and

say that there was insufficient literature about intensive research at that time; however, a researcher intending on a similar study now has much greater support and thereby my second suggestion.

It would be appropriate to settle on a method for intensive research at the outset.

The one thing that I was able to take into the research that helped me immensely was a background in industrial culture and general office-work culture. I actively pursued knowledge about the companies products and processes and tried to understand how everybody interacted before I started asking too many questions of my own. I found that the domain knowledge that I built up was eminently useful through the project; it allowed me to ask context specific questions, to not look like an academic 'ivory tower' type, and to analyse comments and events in an hermeneutic way. Indeed I would suggest that in the first stages of the research, the process of getting to know the context takes precedence over building theory in relation to the topic. The results presented in Chapter 7 spring mainly from the NPD and Training cycles, with rather frugal representation from the early cycles. It is my belief that this is the nature of PAR and in all likelihood any other project I undertake using this methodology will have little that is academic to show in the early stages. So perhaps more style related than methodologically critical I provide my last suggestion to a budding Action Researcher.

Try to know the client and the context as well as you can before you attempt to know what you set out to know.

8.4 Conclusion of the Success of the Research

Section 5.8 reviewed the suggested measures of quality for this thesis, and as such the reader is pointed in this direction to understand how well the AR interaction went and how well I facilitated the research. Having also attempted to generate theory grounded in an organisational context I can repeat the research objectives and discuss them in relation to the results that I presented in Chapter 7.

8.4.1 Research Objective 1 - new theory

Create theory grounded in the expressions of individuals in the context of organisational life and related to the combined organisational and societal values of the research participants.

Every attempt was made to make the Action component of the research as 'organisationally natural' as possible. I developed my involvement with the organisation so that I was accepted in their normal tasks of process improvement, and I attempted to get the research participants to lead change initiatives.

In hindsight, the active intervention nature of Action Research was slightly at odds with

the naturalness that was sought from an ethnographic perspective; however, Participatory Action Research tends to be more natural in that it is the needs of the participants rather than that of the facilitator that drives the intervention strategy, so the apparent discrepancies may have been non consequential.

The interviewing strategy was formulated to minimise academic bias on the emerging stories from the field. The strategy was shown to have less influence on the significant comments of the participants compared with a similar AR interview conducted in a non participatory AR project.

8.4.2 Research Objective 2 - existing theory

Establish an opportunity to compare the existing experimentally derived theory of ACT's against an actual social construction of the technology.

The surprise that came from results was that decision making was minimally affected by the use of computer based ACT's. Whereas, purposeful studies into decision making using ACT's often find differences in some aspects of decision making. The conclusions that could be drawn from this significant difference are;

- ☒ That experimental methods do not sufficiently capture the essence of organisational decision making.
- ☒ That the participants in this study were all far from an average example of decision makers or ACT users.
- ☒ Or, that the method or organisational level of analysis uncovered political or

social forces that moderated any effect that may have been found in experimental conditions.

Apart from the distinct lack of decision making effect, there was an apathetic response to use group moderating processes. Although a great deal of literature exists about group facilitation using technology, these results question the current utility of this area of research.

8.4.3 Research Objective 3 - reflection of method & repeatability

To develop a useful and purposeful method for IS research that could assist in addressing contemporary IS problems facing society.

The comments I have made about my use of a PAR method will come across as mixed. I have made some comments about how to improve the process, and no doubt, some people will gather that not all of my experiences were positive. I must reinforce at this point that I believe using a PAR approach will provide a significant contribution of *practice in theory*, and cement the relationship between the corporate, the community, and the academy. On balance I believe that the knowledge presented in this thesis is genuinely grounded in reality and a very useful stepping stone for further work using a PAR methodology. The inevitable next question is *how does this research tie in to academic progress?*, and this is addressed in the last chapter, Discussion and Future Research.

8.4.4 Research Question

Did the research discover “how the cluster of technologies associated with Email change social interaction in an organisational context?”

The technological democracy abstraction does not immediately answer this question holistically, although many of the descriptive components do form a useful picture of the social interaction of this cluster of technologies. The technological democracy concept was drawn from the absence from the literature of a rich theory of the democratic potential of Email and related technologies. This research allowed a complex empirical perspective into Email use and the democracy component of the results is one narrow output from this project that was framed by the values of the researcher and some of the participants.

However, the confirmation of Media Genre as a useful explanatory concept does immediately answer the research question. The prior work into this concept was published in Business and Administrative journals and now is shown to be a central defining factor in Email use.

The synthesis of other prior literature should also be considered to assist in the conceptualisation of this question and possible answers. The work of Marshall McLuhan in particular with his ‘Electric Vacuum’ could certainly be useful in framing future theory development and dialectic.

In conclusion, although the end result of this project is quite different from that which was first envisioned, I do believe that I have managed to learn and report on the social use of Email and the related cluster of technologies within a well described context. I also believe that there is a lot more to learn, and with the adoption of an Action Research methodology there may be many people that can extend the knowledge about email use and further the development of theory and implementation to fulfill shared values of all organisational members.

9 Discussion and Future Research

The rapid communication, convenience, and economy of e-mail promotes efficiency, a significant factor in today's economy. If we choose to participate in that economy, we embrace e-mail. If, on the other hand we are mired in the familiar, we might respond to e-mail in the same way a nineteenth-century British gentleman responded to his mail when he learned that it was routed from one city to another by train rather than horse: 'I shall open my mail in three days' time, when it should have arrived.' [Whittle, 1996:53]

The movement in the literature over the last three years has highlighted some similarities with the results from this research project, for example participants associated general attitudes toward computing technologies with email use, a concept that has been supported by Minsky and Marin [1999]. Email was considered to be a business tool that was efficient and useful, the straightforward, uncomplicated use of this technology by the

majority of the staff is comparable to a study undertaken by Winter and Dalton [2000].

However, the literature has also seen a continuation of the media richness and reductionist approaches to studying email where email is treated as a single media, which has been shown in this study to be an incomplete simplification.

The democratic nature of the technology cluster has been fairly well ignored. This chapter, then, discusses the two major findings from the results section: Technological Democracy, and Media Genre. The challenges and opportunities for future research follow at the end of the chapter.

9.1 Technological Democracy

Democratic technology design was a motivator for this research, and indeed democracy and decision making have been quite a large aspect of prior email research. Email and file distribution ACT's did not appear to change the decision making process in this study except to increase the use of information at the beginning of the process and acceptance after the decision has been made. Increased information usage is supported by a field survey [Teng and Calhoun, 1996:698] [Young, 1995:27], whilst decision acceptance is probably too difficult to study in a laboratory and we will have to wait for more intensive research to better place knowledge about this. If democracy is important to academics and professionals, then making a place for the democratic design of these communication technologies, rather than simply testing how democratic they are, could

be a significant area of future research that shall be addressed at the end of this chapter.

Specifically, the aspects of the email and public folder system that featured as being the least democratic was the lack of administrative privileges of the local technicians and the users. In other situations the local technicians at least would have access to this level of access, whilst users would most probably not. Certain aspects of contemporary office 'productivity' packages seem to be undemocratic and will probably remain that way as the market demands a tightly integrated packaged solution with all the *bells and whistles*. Unnecessary structure and procedures can be ignored in some situations, such as automated rules and workflow management, but the necessity of access for task related communication, and the imposition of planning through system calendaring, ie. booking resources using a calender or scheduling a meeting using a busy search, requires the individual to work in a certain way that is prescribed. Less structured ACT's, such as Lotus Notes™ may offer a difference with regard to a democratic technology. Notes, and Domino, place a burden of learning on the user to create this flexibility, but allows the creation of communication databases and workflow systems that are owned by the local community of users. At CHHp they had a tradition of creating their own databases and spreadsheets for analysis and management of local processes, it could be that the move to greater autonomy in their communication systems is equally received. However, given the opportunity to undertake this sort of experimentation using the Exchange server, they overwhelmingly declined. I cannot determine if this was due to them being simply not ready for this next move, or whether it truly constitutes a significant avoidance of this set

of features. The enthusiastic uptake of the public folder system for simple information dissemination did suggest that the use of moderated lists, and workflow features were avoided for substantive reasons.

9.1.1 Signification, Legitimation, and Domination

Certain aspects of this research touched on the general aspects of communication technologies that contribute toward democratic discourse. Specifically, 7.4.7 conveys some aspects of control and domination, whilst 7.4.1 discusses certain aspects of the social legitimation of the communication technology. There was certainly some minor dominating practices evident; however, there seemed to be an absence of what might be called bureaucratic domination (Harrison, 1994: 257), although these forces seemed to be evident in the Academic Cycle. Specifically, the following words were automatically added to the coding frame to cope with the addition of transcripts from the academic cycle:

political, bureaucratic, diplomatic, derail, pawn, socialist, Symbiotic, corrupt, influential, repercussions, subordinate, unanimity, autocratic, derailling, authoritative, rhetoric, PR, diplomatically, deliberations, prejudicial, machiavellian-type, controversial.

This would suggest that the industrial context was far less political than the Academic

context, which is supported by Dyrud (2000:2), and indeed there is much discussion in literature on such things as “*hermeneutics of suspicion*” (Brown and Lightfoot, 2002: 209) and the “*software stiletto*” (Caircross, 2000) both referring to political use of Email functions “CC” and “BC” respectively.

Although it cannot be said that these political phenomena were present in the main part of the research, and the analysis in the Academic cycle was insufficient to “truthfully” suggest that these things existed, some minor evidence would suggest that there is a certain appreciation of the concerns outlined in these concepts (see section 7.3.7).

9.2 Media Richness, and Genre

Rational choice and social influence theories have been represented in reported research into ACT’s in the eighties, nineties, and recently [Minsky and Marin, 1999][Kanfer, 1999][Dimmick, Kline, and Stafford, 2000], and provide a cornerstone set of rational theories against which adoption and use experiments have been tested.

Kanfer (1999) outlines a recent survey of community leaders where a survey approach was undertaken to determine the social presence of email users communication in comparison with non email users. Disregarding the conceptual problems with the constructs, the results are weak and the utility to either academic, business, or community is questionable. The choice of rational perspectives and methods can only

be ascribed to availability. This is an example of the continuance of the social richness and reductionist approach to studying email that prompted me to look for an alternative method, but fortunately it is not the only agenda for email research.

Dimmick, Kline, and Stafford studied email from the perspective of *gratification niches*, which seems to be informed by advertising and a consumer model of communication usage.

A significant theme presented in the results of this research was the perception of utility and flexibility of email. Email was used for a variety of identifiable tasks; however, it was also regarded as placing little imposition on its' own use. In some ways the use of email could be easily related to previous forms of communication. Replacing the *fax* and the *phone* were identified as uses for email. Replacing meetings was contemplated by many people, but not performed to any noticeable extent. McLuhan described 'Electric' communication as having a structural vacuum.

Electricity has brought a strange elasticity in this matter, much as light itself illuminates a total field and does not dictate what shall be done. The same light can make possible a multiplicity of tasks, just as with electric power. Light is a nonspecialist kind of energy or power that is identical with information and knowledge. Such is also the relation of electricity to automation, since both energy and information can be applied in a great

variety of ways. [McLuhan, 1964: 350].

McLuhan was a popular commentator on media of all descriptions in the 1960's; however, those who are familiar with his work will note that some of his other rhetoric was the *media is the message* and that they are *extensions of man*. These two catch phrases were related mainly to the mass media of the day and would suggest some contradiction to the concept of a *structural vacuum*. But in using McLuhan's concepts here, who was often criticised for borrowing and misusing terms [Genosko, 1999:26], I make no apology, as

McLuhan is unavoidable. No one would deny that a new generation - mark them with an x or any other letter for that matter - is coming of age in the information environment whose emergence McLuhan predicted but did not live to witness. [Genosko, 1999: 8].

Email may very well have a structural vacuum. If you regard email to communication as paper is to communication you can see that email and paper are both devoid of an embedded *social* structure. They both have a technical structure, or *infrastructure*, and it is true that email readers have a generic arrangement of fields that manipulates the composition of the communication to some extent. However, the substantive *social* structure comes to paper when it becomes a magazine, a newspaper, the back of a book of matches, a business letter, a business card, a postcard, or a Post-It™ note. Likewise,

people seem to appropriate structure for email based on their previous experience in other mechanisms for communicating with a particular cohort. However, McLuhan was seeing a little deeper into 'Electric' communication, in that paper having a substance can give us some clue as to purpose outside of the codified graphical and lexical inscriptions it carries. Bond paper, newsprint, and brightly coloured paper all issue a clue as to its purpose. Similarly, if you consider *air* as the structure-less infrastructure of face to face communication, which gains structure tone, protocol, manners etc., it as well, gives you clues based on visual, olfactory, kinesthetic, and audio evidence. Email on the other hand usually comes in one 'brand' dependent on the email reader. Although, different views or arrangements may be available they are not often used. At its base usage email resembles a featureless work area, and a collection of fields that can easily be related to an envelope. In this research, there was a tendency for office staff to issue memorandums via email as attachments, even if these enclosed documents only amounted to a few lines of text. The staff that received these email messages were not generally impressed with starting up a word processor to read a few lines of plain text. However, there must have been a reason why these individuals constructed the memorandum in this way, and it may have been because it was the easiest way to make it 'look' like a memorandum that carried with it all of the same social protocols that had been constructed previously. The memoranda were presented as a word processing document in exactly the same way as if the document had been typed, printed, and distributed by hand - except that the document was not printed.

Another way to phrase this then, is that we are a little lazy as communicators, and as much as possible we reuse existing communication arrangements wherever practical rather than attempting to explain a new set of protocols to those around us whenever we find a new way of communicating. Rather than the receiver appropriating a close enough structure to make sense of a communication act, the structures are available to both sender and receiver, and used accordingly. The social objectivication that Berger and Luckman [1966] discuss is a shared, or socially constructed, reality that both the sender and receiver are party to. If an organisational member steps outside of the internal social structure then they become aware of the social reality in another forum that they occupy, specifically in this research was the involvement of a systems expert in a usenet group and his subsequent conformance to that groups social protocols.

There is certainly one issue that may be clarified if this structural vacuum exists, and that is Media Richness Theory, also known as Rational Choice. Surprisingly many of the critics of Media Richness Theory that have said that it does not deal with the rich contexts of actual communication, whilst they have not questioned whether email is actually a media. Comparing email with written business communication in an organisation, or with one on one face to face communication, would give you only one aspect of email as a media, just as if you were to compare the general use of paper, with the watching of television in a household. If email is not specifically a media, but many media, then it could be investigated using Media Richness Theory for a specific appropriated media use, for whatever purpose you wanted to make the comparison.

Media genre has been investigated previously by Orlikowski, Yates, and Okamura [1992,1994,1995]; however, I arrived at the same conclusion with regard to media genre without having investigated this specific body of literature, which was published in management journals. My linkage was between a general article in a communications magazine and what I had seen in the field. Whether my oversight of not finding these seminal works by Olikowski et al. could be linked to a shoddy literature review or to the lack of recognition that this body of work has received in the IS literature in general is really not significant. The significance of my *discovery*, which later I found to simply be confirmatory, is that it strongly supports this particular concept. Media genre exist and are a powerful formative force in the use and interpretation of ACT's. The question that then arises, is how can this help us understand technologically mediated communication better?

Yates and Orlikowski [1994:561] suggest that “...*the presence of various genres in a repertoire provides clues about a community's organizing process, the absence of genres from a repertoire is also particularly revealing about what forms of interacting are not valued or salient to a community.*” In trying to understand why discussion list environments did not work at CHHp, and why Yates and Orlikowski found very little use of business letters [1994], media genre allows us to look through the organisation at all of the interactions available to the members of the community, and to see how they switch between different infrastructures. At CHHp I noticed a set of instructions on the wall in a meeting room, I did not have sufficient time to write down those instructions,

but essentially they were instructions about having effective meetings and pointed out the importance of an agenda, of a facilitator, of time management etc. In the discussion lists that we were trying to stimulate, we had very little structure that related to the normal meeting structure of this group. Process improvement meetings were held regularly and were recorded in formal minutes and included action planning. When we tried to facilitate discussion of system development documents we changed the interaction dynamic too much and made it difficult for individuals to figure out how they were supposed to behave.

What media genre really means, is that we can study specific genre in more detail, and to some extent this course of action has already been started. The specific courses of research into media genre will be discussed in the following section Future Research.

9.3 Future Research

9.3.1 Technological Democracy

Investigation into the social construction of information and communication technologies in general would need to start from the concept of technological clusters. A method that was able to explore the *social objectifications* of the cluster would allow for comparison with other contexts, and certainly there is an element of very broad societal wide influences on the perceptions of individuals with such technologies. Within this research agenda can lie the question about the *degraded nature of work*, and the promotion of a face to face community. Moving on from the one context could allow for an exploration

of different behaviours and design criteria for organisations and communities.

Research into design methods and the integration of democratic processes into software and information systems development would be another useful step. Some element of democracy has been emerging in development processes. The recognition that the 'user' can actually have a valuable contribution into the process has typically been phrased in the short term objectives; project success factors, profit, usability test results. The ongoing contribution of organisational members may also be beneficial, and ways and means to keep the contribution continuing could be explored. Moreover, the reasons for getting the users input can also be explored, this may help to broaden the criteria for development success.

Each future research project into technological democracy hinges on the value systems of the researcher and the participants. It may be perceived that a democratic system is not ideal, therefore, research into the *total cost* of a democratic system would be a very worthwhile endeavour.

9.3.2 Media Genre

One area that seems to have the potential to reap significant research rewards is an investigation of different forms of email interaction, both apparent and possible. The flexibility that is inherent in email technologies provides a 'blank canvas' for many different types of communication. Allowing people to overtly express their intention

within the structure and 'cues' of the format and presentation could provide a useful aid to effective communication. McLuhan would have described email as being 'low definition' requiring high involvement of the readers sensorium. Much like television is to film, email is to a hand written letter - what McLuhan would call *light through* rather than *light on*. The loss of personalised imprinting, the browser dependent fonts and the distancing of generation and display reduce the definition of the message making the involvement by the reader deeper. The reader is required to create images in his/her mind, create textures that can be virtually felt or create a recognition of a scent, this involves more of the reader in the consumption of the text; however, anything that is included in the text as a stimulus to that involvement will be pounced on. An example of text from one of the research participants can illustrate this;

Hi Robert

Sorry about the Crappus Contactus.

I've been on Annual leave for two weeks, harassing the New Zealand Fish Populations.

A new NPD system has been implemented. It is written in a Database format, and lives on an SQL server.

James has spear headed this development. I haven't seen any evidence that the system is based on any one form of methodology. It appears to be mainly a tool, rather than an expert process.

I'm not terribly up with the play on this any more, since I am now back up the Front, in a production leadership role.

If you want further info about the system I suggest you contact James.

The flippancy of the opening line makes an immediate impact of relaxation and a sense of comfort. I immediately picture this participant in his office in a sense of ease where I have met him on frequent occasions. Personally, having been at the factory I can smell industrialness of it and feel the uniqueness of the air quality, humid and warm. Having just returned from holiday this individual would be catching up and fitting into a new role and this evokes a 'busy' atmosphere. As an exercise, see if you think these things when you read email or other text based Asynchronous Communications (ie. Discussion list messages). A very useful research thread would be to study email as a media, and investigate the process of the consumption of the text. It should also be noted that there are other methods for invoking sensory recognition and explication of genre, ie. formatting, addition of pictures or sounds, emoticons. In a day to day sense, how often are these used and recognised? Are there readily available texts that allow for universality of these devices? Does sensory involvement change between cultures?

9.3.2.1 *Developed and Developing Genre*

9.3.2.1.1 *Marketing*

Spam mail, apparently named after a Monty Python sketch where John Cleese is sitting at a news desk and says "*Spam. Spam.. Spam... Spam.spam...spam...spam.. spam [etc.]*." was the first form of Marketing using email. Since spam was introduced there have been various *improvements* on the ability of individuals or companies to *harvest* email addresses from the Internet or from unprotected discussion list servers. Recent research suggests that 90% of Internet users receive spam email at least once a week

[Hearn 2000], and that spam is a well established genre.

On the more professional side of marketing, there has been a significant level of activity in email service to support existing customer bases [Mack 2000, Lewis 2000], or to advertise to new markets [Bannan 2000, Miller 2000]. Appropriated email genre in this area are potentially: leaflet drops, requested informational brochures, news bulletins, and promotional announcements. However, marketing people know that they were second off the mark, and they have a great deal of work to do to prevent people from perceiving their attempts at communication as spam [Sterne, 2000].

9.3.2.1.2 *Love, Chatting and Smut*

Virtual romances and cybersex have been prominent in films and on popular television programmes for some time. At the root of this collection of activities is the ability to gossip or chat on email [Wishart, 2000], and email has a well developed genre for this purpose. Special characters and short hand predominate online chatting and coherent communities exist where specific types of chats continue without end. Meanwhile many companies and government agencies have had to carefully monitor email use. In 2000, five hundred U.S. Navy employees were disciplined for misuse of email, and 38% of major U.S. employers were monitoring their employees email [Ferris, 2000]. Smut and email *humour* are a very well developed genre use of email.

Dimmick, Kline, and Stafford [2000] reported on their research into “*The Gratification*

Niches of Personal Email and the Telephone” and this expands greatly on one area of genre appropriation. Specifically this research attempted to find out how well email replaced the telephone in this particular media genre, how it displaced it, and complemented it. This style of research still has a competition model of media choice, but deepens our understanding of the relationship between the media structures and social dynamics.

9.3.2.1.3 *Task Related*

Report writing via email has been used by my supervisor, and others [Davis, 2000], to collaborate with colleagues that were distant. Internally, most professional offices have Intranet services or organised common network storage mechanisms; however, outside of the organisation, including the organisation in this research, individuals needed to collaborate with remote collaborators. For the most part email has been able to cope with this process, as if the process involved the mailing of drafts with attached notes {in the case of email it is the other way around}. However, internally we use files stored on commonly available resources that are accessible by either party, in most cases, one at a time. The addition of a note may actually make the collaboration process easier; however, the ability to access the document when you are ready to, rather than when it is sent to you, may similarly increase productivity. A very useful study would be to determine the predominance and effectiveness of these two different styles and to see if they could both be transferred into the other infrastructure in a socially acceptable way³³.

³³ie. this could be implemented using FTP in one direction, but fewer people use FTP than HTTP, or general email.

In this research study there were specific uses for information dissemination using the file management system {mainly technical, training, and process related}, and specific uses using email {mainly office administration, and social}. A deeper historical and ethnographic investigation could uncover the specific sets of documents, or communication channels that were providing the existing models for the now electronic communication, ie. did the training people use a set of folders with training resources?

Similarly, email has been used for business negotiation [The Economist, April 2000]; however, it has also been shown in this article, and in this research project, that email needs to be used carefully. Investigation into the appropriation of useful genre could help in making negotiation a little safer.

9.3.2.1.4 *Official and Legal*

At my place of work we now receive our pay slips by email. The format of payslip in email was as a plain text attachment that when opened in a simple text reader with monospaced font, with ASCII form character boxes, looks very much like the traditional *no carbon required* line printers that printed created the old pay slips on pre-formatted forms. Although there was a revolt by the technically oriented people, in that the email messages were unencoded and could possibly be residing on an unsecured server somewhere as plain text, the majority of the employees accepted this transition without incident. Perhaps the ease with which the transition occurred was due to the similarity between the new and the old forms. An interesting avenue of investigation could be

whether the transition is as smooth if quite a different presentation was applied to the payslip. The addition of pictures, colour, and nice fonts would be a subtle technical change, but could have significant social implications.

Likewise, the transition to email of other official or legal services may also be attempted or trialed in the future, as in one example where the high court in Dubai had to rule on whether a man was able to divorce his wife via email [Goode, 2000].

9.3.2.2 *The Return of Media Richness Theory*

Having been so critical of the predominance of Rationalist Approaches I am hesitant to promote them; however, it hangs heavy on my conscience. One way that positivist researchers could improve their experimentation and survey of email use could be through identifying specific media genre and making comparisons across multiple communication infrastructures. Magazines are now available as e-zines, Newspapers are available as portals, business notifications are sent through email, and maybe traffic tickets may come the same way one day. Using media genre to separate the space that email and other electronic communications occupy could provide some fruitful avenues for research and experimentation. Further discussion on media richness theory is ensuing, with one writer suggesting that evolution theory be used to replace the concept of richness with naturalness [Kock, 2001]. Although such agenda's from a positivist perspective where the social research is perceived as being not predictable, establishing "*that social influence are not uniform but depend on social background and culture*",

need to be checked from an interpretive perspective where social influence is very uniform and predictable as a social objectification [Berger and Luckman, 1966].

9.3.3 Other Future Directions

Email has been described as creating thin relationships [Kanfer, 1999]. At CHHp one of the participants described email as not being “full suite”, and others [Smith, 2000] have recognised that for some uses it does not meet the needs of the appropriated genre. While some attempts have been made to overhaul email with added functionality [Lardner, 2000], or with multimedia [Katz, 2000], the limits on changing email are currently restricted to communication bandwidth and server capacities [Fontana, 2000]. A colleague sent me a video email and even at low quality it was in the order of 500 to 800 times the size of the equivalent message in plain text. Even if our existing systems are increased in capacity and speed, the slow speed systems of developing and remote countries, the emergence of mobile computing and small devices [Doherty 2000] [Hafner, 2000] [Palenchar, 2000] means that the *thinness* of email will continue. Research into specific media genre that are considered to be thin, i.e. one to one negotiation in business, would allow researchers to focus on problematic areas that need attention, rather than studying all email communication in general.

Appendix 1

Statement and interpretations summaries by search process. These tables were generated from significant data in the recorded interviews and interpretations are made to link the data with the context or with other participants comments where necessary. This data is not the totality of that available for analysis but it does provide a useful overview of the participants comments.

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
1) Dave/ 11,19	<p><i>"..it became apparent that it [email] was an excellent tool..... really an internal system....a pain in the backside because you'd have to rely on phone calls and faxes."</i></p>	<p>efficiency</p>
Mike/ 19,53	<p>Dave talked about the introduction of email and how at first it was only used inside the company. Email was recognised as an extremely useful tool which is highlighted by the direct comparison of the frustration expressed by having to use other media.</p>	<p>However, Mike commented that <i>"a lot of people around here avoided it at first. Certainly, I didn't use it a lot to start with, at all... That may have been because of my job role at this stage, .. I had to share (a computer) .. "</i></p>
Norm/ 108,160	<p>Supported by later comments about interactions with suppliers, and a further statement <i>"it is a really efficient means of communication"</i></p>	<p>Kiri commented that <i>"Email never gets to the operators on the floor. A lot of people think that it is because they are CHH users, everyone always finds out..."</i></p>
Kiri/ 132	<p>Mike supported the efficiency aspect by saying <i>"..Internet and email has replaced a certain amount of phone calls and letter writing. It's faster.."</i></p> <p>Norm suggested that it was peoples general attitudes <i>"toward computers"</i> rather than their attitude toward email etc specifically.</p> <p>Kiri suggested that email <i>"increases communication"</i>.</p>	

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
2) Dave/ 11,21,29 Mike/ 47 Glenn/ 70	<p><i>"..with a 5 minute phone call you could lose upwards of two minutes ..."</i> Dave talked about the overheads apparent in phone and fax use and explained that these were not evident with email. Supported later when asked about how it changed decision making - <i>"Just the speed"</i></p> <p>Also confirmed by Mike <i>"The way I see it, email is only a tool to provide information it's not really going to change the way you have to decide things. You still need to look at all the information .. a big part of making the best decision."</i></p> <p>Glenn also affirmed the treating of the communication technology as a tool in that the machinists, who have always worked with tools, use the appropriate tools for the type of work they are doing. An engineering perspective is efficiency and minimise wastage, these workers need to see a job related productivity gain in order to use these communication tools, and that isn't always clear with ACT's.</p> <p>Ruth also referred to other automatic technologies <i>"..when I rang up a lot of people they had their answer machines on. So you didn't get too good a response, and it takes longer I found that a lot of people read their mail and answered it quickly."</i></p>	<p>efficiency overheads decision making</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
3) Dave/ 11,13,87	<p><i>"...make some comments to the attachment and then you can set up a conference call..."</i></p> <p>Dave said that the only way that email affected his decision making process was because of the ability to attach spreadsheet, wordprocessor, project, database, or graphic files that another person could look at or alter at the other end.</p>	legitimacy attachments decision making
		Interestingly Dave mentions using the phone or a conference call in this process. Email is only used as a carrier device in this situation.
4) Dave/ 23,	<p><i>"...they didn't want to see us as a NZ company ...like to see us at least in the same town... And we said with electronic media, whether we are 30 km away from you or 2000 km away, it doesn't matter a hill of beans."</i></p>	distance media

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
5) Dave/ 27,55 Paul/ 81b Glenn/ 20	<p><i>“The variety of users, if you get someone like... His knowledge and ability....His administration and file management ... is far superior and he’s got a lot more tricks and short cuts...”</i></p> <p>Admiring another member of staff who has gained mastery over personal computing facilities.</p> <p>Paul <i>“..using email alone they will succeed because they have grasped new concepts and ideas...”</i></p> <p><i>“and basically even though I could do most of the stuff I was shown easier ways to do it. I could do everything she wanted us to do but I had a long winded way sometimes of doing them. And she showed us a shortcut and things like that..... It’s like anything, you exchange ideas, and there is always someway better.” -Glenn</i></p>	<p>legitimacy</p> <p>learning</p> <p>ability</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
6) Dave/ 35,41 Paul/ 153	<p><i>"..everything comes in uppercase... Other guys, the messages are all very short and you wonder how comfortable they are with it as a means of communicating. ..or there'll be a great big dissertation with that much content in it you want to keep that ..would have been better off, doing it as a document.. attaching it."</i></p> <p>Dave outlines a number of points that relate to the legitimate use of email in this social context and in some ways extends to common use netiquette.</p> <p>Email should not be too brief, but over a certain size, perhaps in relation to the viewable window size, the message is better treated as a document.</p> <p>If people attach a document to an email but leave a default file name "doc1" this is frustrating to Dave</p>	<p>netiquette legitimacy messages - documents</p> <p>From Paul, <i>"..they conceive it as a polite way for normally polite people to send shitty emails or other people to send them junk."</i>, Paul admitted to sending somewhat blunt email.</p>
7) Dave/ 43,47	<p><i>"You can tell if people have opened it but even if .. I'll just reply, Yes, received, thanks very much, will get back to you next week...so it's confirmation it's a useful thing."</i></p> <p>Dave points out that he considers the practice of providing minor feedback to be worthwhile.</p>	<p>feedback</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
8) Dave/ 57 Norm/ 46 Kiri/ 98, 152	<p><i>"...sending you an email with an expectation that you are going to do something for them or somebody else, there is an automatic expectation that they have kicked the ball over the net and in doing so they have discharged their responsibility.." - Dave</i></p> <p><i>"If they send an email message, they may think they have done the job and they are out of it. If they phone I am not sure if there is a reluctance to phone, but with email you don't seem to bother. Maybe it's the frustration of getting through or... I don't know..." - Norm</i></p> <p>In the first group meeting I had with senior management this sentiment was expressed, in that managers were complaining about time being "stolen" by email requests and interruptions.</p> <p>Kiri not only confirmed this behaviour, but admitted to being guilty of it sometimes <i>"You get people, you get certain peopl that do everything through email, and it's probably to pawn off work, it's a lot easier, you don't have to see the person..... I must admit I am a big sender of them. Just some things ... it's so easy to write an email than to get off your butt and do it yourself."</i> But Kiri also admitted that she did not condone the behaviour <i>"It's that the time that, ..it would be easier for them to do it themselves. ... I know this person that works here got 52 emails in a day, and it was just loading work on her. She can tell you something about email!"</i></p>	control time confrontation

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
9) Paul 15	<p><i>“The amount of junk mail coming into the organisation! In fact I just got the best chain letter I have ever seen this morning, it’s a really good one.... No, it was a really good one- taking the piss out of all the chain letters that have ever been sent.”</i></p> <p>Paul is sending mixed messages with this comment, but the delight of sharing office humour is tinged with the need to get his job done and knowing that this sort of behaviour is overtly frowned upon while being covertly encouraged.</p>	<p>legitimacy genre humour</p>
10) Paul/ 31,37 Tim/ 109	<p><i>“It would probably be replacing people sending faxes, you know you get junk faxes coming through ..I think it is replacing that. .. you don’t have to worry about going to a centralised fax .”</i></p> <p>Paul builds on the earlier comments about sending junk material through email, saying that this has replaced a function that used to be applied to a facsimile machine, although email was decentralised in comparison and avoided the secretaries.</p> <p>While Tim is adamant that this is abuse <i>“But it can be abused. The only thing abuse wise is all the junk email that comes through. A joke goes around the world twice, I don’t know how you can change that.”</i></p>	<p>legitimacy genre humour decentralisation abuse media</p>
11) Paul/ 55	<p><i>“..I don’t always use the same keywords .. so I could spend a lot more time setting it up than the value I would actually get out of it..”</i></p>	<p>overhead - learning legitimacy</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
	In relation to automatic rules doing things manually is seen as being more appropriate.	
12) Paul/ 57	<p><i>"..we would get stuck with things we had done through telephone conversations, but not backed up in writing.."</i></p> <p>Paul explicitly relates the recorded aspect of email as being different and superior to the telephone.</p>	recorded media genre

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
13) Paul/ 57	<i>"...you need to be very careful about the way you word emails and you need to be sure you make personal contact every now and again, and just sort of shoot the breeze. Because otherwise email is a good way of</i>	media richness low definition
Dave/ 29	<i>communicating and getting information, but it's not necessarily full suite communication....Yes, basically</i>	However, Dave mentioned that email "can be formal or informal or whatever, it is totally flexible."
Norm/ 40,44,46	<i>communication with all the energy and all of the personal expressions and all that sort of stuff that goes with full communication."</i>	
Glenn/ 42	<p>Dave and Paul are in agreement that email does not handle the full spectrum of communication potential. However, it is important to point out that this concept was introduced to Paul in an article in a trade journal that was informed by media richness theory.</p> <p>Norm went further and suggested that a lot of the interaction that they have needs to be face to face. "I'll go up and actually see them for that process" Norm walks up the stairs and down a corridor and looks for the people in the design department physically. "It's pretty hard to discuss routine stuff over email....Yeah, some of the technical stuff we need to discuss you really need the people to be there. Talking over the phone or talking over email it's really hard to convey anything."</p> <p>Glenn is Norms boss and comments "...I would be very frustrated with my guys sending email upstairs rather than going up to see them."</p>	also relates to item number 14)

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
14) Paul/ 65	<p><i>“an example in that article there, where two lawyers .. trying to put a land deal together.. one lawyer writing to another made a flippant comment... one client gave the client a bundle of papers with the comment...and damn near called the deal off because of that comment..”</i></p> <p>In an informal interview a different person (Kevin) mentioned that they hope that everyone pays attention to some of the comments that are passed around via email, especially when they are have a large forwarding history. If some of the internal comments were sent to the client there could be problems.</p>	<p>media genre - fluidity formality</p>
		<p>nb: the difference between a scratched note on paper and a formal communication with a client is the entire package (media genre). With email, a note to a colleague can be similar to a note to a client or supplier.</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
15) Paul/ 67,69,71 all.	<p>When asked about whether any of the changes had been sudden or incremental Paul commented <i>“It has been gradual, even now people do not fully appreciate the links between calendar .. very few people actually used the calender as an organising tool.”</i> Glenn supported this by saying that <i>“I would go in there and use the calender and book a conference room or something like that ..but not to put all of my appointments in - no. It’s far quicker to set my goals for the day and set my times [in physical diary].”</i></p> <p>Legitimacy for individual components within an ACT can vary. The different functions, whether separated by behaviour or by discrete screens are treated differently.</p> <p><i>“..people are reluctant to any sudden change as a general rule.”</i></p>	<p>legitimacy critical mass adoption change</p> <hr/> <p>All respondents viewed the changes to communication, electronic organisation, and document management as a gradual process. None could site any specific act, besides training, that made a significant impact on email use.</p>
16) Paul/ 113,115, 12b,67b Tim/ 47	<p><i>“Yeah, we are creating a lot more, there is a lot more public folders in there now and they are for all sorts of things, I have created a few NPD ones. There have actually been a couple of public folders for some of the performance enhancement projects.”</i></p> <p>Toward the end of the research Paul was asked to comment on the uptake of any of the changes that were discussed earlier. When asked whether any public folders were created for discussion Paul ventured.</p>	<p>media discussion lists document handling information</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
	<p><i>“No, it’s purely for information storage.”</i></p> <p>Commenting on the success of the use of public folders at the time of the research Paul said.</p> <p>“Yeah, I think it was an excellent, an excellent suggestion, I think we didn’t utilise it to it’s fullest extent and the main reason for that is that we didn’t publicise the document was there ready for discussion very well. It was our fault..”</p> <p>After this interview I met with the site IT support technician who confirmed the significant rise in the creation of public folders. An investigation of a random collection of folders confirmed that they were predominantly used for the distribution of documents, even though they had the potential to facilitate moderated or unmoderated discussion list that had been created earlier in the research project.</p> <p>Paul later, when asked about whether he would continue using public folders again affirmed (segment 149b).</p> <p>Tim also supported the efficacy of the public folders system and also the legitimacy of the additional effort</p> <p><i>“... I think once you get used to working with the folders you have much more direct access to a lot of stuff, and you can be more informed. ...you don’t need to ring a person because you can actually look at their running files on something. So everyone is in the right work habits then they have everything up to date.”</i></p>	

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
17) Paul/ 133,135	<i>"...his only real fault is that he over communicates, I don't think anybody has heard of that one before but he likes to communicate and he likes to do it in person. But I think that there are certain things that could quite easily be done through email and more use should be made of that."</i>	legitimacy media
18) Paul/ 8b,	<i>"I think that the timing that you came into it was appropriate. ...I don't think any of us had really thought about that ..we needed to take the next step and present it and get feedback..."</i> Paul suggested that the public folder system was good for the presentation of ideas; however, the feedback was received through one on one interaction through email or face to face, and group feedback through face to face meetings. Paul said that this way was <i>"much more efficient.. that if you can just get people to provide the important feedback, unfortunately email is not as 'in your face' as a stand up presenter"</i>	media communication process interaction

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
19) Paul/ 16b,18b, 28b	<p><i>"..if they just had some accurate timely information and knew that they could trust, that they had easy access to, ..."</i></p> <p>When asked to elaborate Paul mentioned a case when information was incorrect.</p> <p><i>".. So this had ramifications to them through the project, through the plant. To me it wasn't a particularly high priority project in that, compared to a lot of stuff we are doing, but it caused problems and instability in the plan, .."</i></p> <p>Compared to the alternative method of communication.- <i>"The person would make a phone call to me and I would have to go and get it from the horses mouth, invariably I couldn't just get it by ringing someone else because they would be walking around a molding shop.."</i></p>	media richness information

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
20) Paul/ 32b,43b	<p><i>“I cannot organise meetings on the day they are to happen, through email.. I have to personally verbally advice each one, and that’s not something that I particularly agree with but they just won’t accept it any other way and I haven’t got time to negotiate with them... But having said that if we want to organise a meeting for tomorrow then it is quite easy...”</i></p> <p>A legitimate use of synchronous and asynchronous communication technology and the difficulty of arranging meetings. There were suggested technical solutions discussed but most seemed problematic either from a technology perspective or from a cultural-operational perspective. However, the frustration at the current process was aired.</p> <p><i>“...but I think at the moment we have got secretaries at the front booking meeting rooms and I think that is just an absolute waste of effort.”</i></p>	<p>asynchronous communication legitimacy</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
21) Paul/ 46b Dave/ 55 Melanie/ 91	<p>On a similar note Paul commented about the problem with arranging meetings at different facilities.</p> <p><i>"...effectively, meetings didn't need to be more than two or three hours, they became drawn out because we made a trip out of it..or they made a trip out of it to us, that was a problem. That took out a full day out of anybody going from .. or coming from. And I seriously don't think that anybody has got that time to throw away at the moment... I am sure there are tools that can be used, I've heard people talk about chat rooms on the Internet ...and the dialogue of what comes at the end of it becomes the meeting minutes...maybe video conferencing but in a corporate network like it is, it is very important that you have documented records and having email records is the better way to go. I guess you could also have a video tape.."</i></p> <p>Melanie preferred to email confirmations of telephone calls rather than use the fax.</p> <p>Melanie described the perception of an email record in that <i>"People know that if I said something that there is a very good chance there will be a record somewhere."</i></p>	<p>distance media records efficiency</p> <p>Also, whilst some participants could quickly retrieve email that was a year old, other participants kept limited records of old emails <i>"..so it's the big 'X' button"</i>, Dave.</p>
22) Paul/ 51b Melanie/ 41,45	<p><i>"...in fact quite often we will do that here, someone will start off, and they will just send out a note to everybody, ... and so the person that receives it, the person it was directed at will click on the 'reply to all button', and they send back their response, and so everyone can be watching this ping pong back until they see an</i></p>	<p>group interaction decision making legitimacy cocktail party discussion</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
Glenn/ 102	<p><i>opportunity when they need to step in and say something, and then they will come into the network as well, into the discussion. .. but unfortunately it doesn't seem to be... a very effective way of drawing things to a decision yet. You always get the point though where you need to ring the person concerned and talk it through with them rather than trying to do it on email."</i></p> <p>Melanie who works at a different site reiterated this social norm <i>"..when you send out a group email and then you get peoples feedback and if you remember to hit reply to all instead of just reply... from that point of view it's been good,.."</i> And Melanie also made a further comment that reflected the second issue <i>"... it is also good for a pre-meeting type conversation too, you can get everything sorted out. You have got a better idea before you go into a meeting.</i></p> <p>Glenn also, in very similar words confirmed this as being both, the major social interaction, and the predominant group decision making style <i>"...they will forward copies, cc's, to half a dozen people and they'll all read it and come in with their two pennies worth and then someone will come in with something else which will inform us straight away...to make an informed decision in a very quick time period"</i></p> <p>Tim's comments added an explanation as to why there may be an upper limit on the number of people involved in a <i>cocktail party</i> decision process - <i>modesty - "I</i></p>	

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
	<p><i>wouldn't call it abuse but I think to copy it to every man and his dog or something just to make sure the message is spread wide and far they might be doing it to be seen to be busy. There are some different drivers with different people, I get a lot of stuff that I have no interest in, and the person doing it is probably quite genuine, thinking I need to know". Searching for explanations for this behaviour could also be taken as evidence that sending email to large public lists is seen as detrimental.</i></p>	
<p>23) Paul/ 91b,93b, 101b Glenn/ 78,80,82, 84</p>	<p>Paul starts talking about the reduction in secretarial staff due to wordprocessors and P.C.'s, then moves on to talk about spreadsheet use and then email.</p> <p><i>"...spreadsheets get rid of anybody who has to manipulate any kind of figures...(with email) you are minimising administration, you don't have to worry about...if you are an idealist you would say that you ... would minimise your paper usage, but in reality that doesn't happen because not many people can read computer screens.."</i></p> <p>Glenn supports this by suggesting that email and office productivity tools have come in and had to be used because of the reduction in middle managers, 'secondary' persons, and secretaries. He also complains that he has to perform many functions and the diversity of skills that he needs is tremendous.</p>	
<p>24) Mike/</p>	<p><i>"You write something down rather than trying to ring them up and discuss it with them. So you tend to lay things out a bit better in some circumstances."</i></p>	<p>discussion media</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
25) Melanie/	<i>“Email is far easier for transfer of information and stuff like working out when we’re going to the pub and things like that, the important things that happen...”</i>	social information
26) Melanie/ 101 Tim/ 41 Mike/ 47	<p>Melanie works at a site that is distant from some of the personnel involved in similar and supporting tasks for her role, importantly, she noted that email change her decision making by allowing access to individuals that were not always physically available <i>“Well I tend to get a lot more peoples input, it’s so much easier to do that rather than just talk to people that happen to be on site on that day”</i></p> <p>However, this is moderated by both Tim and Mikes view that <i>“..I think that the same person is going to make the call at the end. It is a means of getting more inputs into making the decision.”</i>, <i>“ No I don't think there has been any change. The way I see it, email is only a tool to provide information it's not really going to change the way you have to decide things... The responsible person still has to make the decision”</i></p>	distance media decision making
27) Norm/ 2	<p><i>“Well it’s not much good being given a tool and not knowing how to use it, I was given something ...training, I’m not sure how long before it was given, it was probably 3 to 6 months... so that’s really frustrating.”</i></p> <p>Although there were sessions advertised and run there appear to be a large number of staff that missed out on these sessions, hence the need for additional training sessions that were run in the course of the research project, Norm wasn’t able to attend one of these sessions</p>	training

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
	<p>either. This is a difficult issue to decipher.</p> <p>Tim’s comments may add light to this issue, along with comments made informally at another instance <i>“I think what needs to be done is someone needs to stand back and look at all of the users, sort of put them into groups ...”</i>, other people commented that the training had to both; support the users immediate needs, and be appropriate for their role. Generic training sessions were often ignored dismissed.</p>	
<p>28) Norm/ 50,54,56 Tim/ 81</p>	<p>Norm reads Internet newsgroups for information about the production equipment they operate. In short, this equipment is part of a CAD/CAM system and requires software know-how to configure and run it correctly.</p> <p>Norm became in charge of this process and has a great deal of responsibility in a role that is unique in the organisation. A single software glitch can cause damage to the machine and the right-off of expensive tool dies (a block of very high quality steel costing thousands of dollars); however, Norm relies on information relayed on the list server <i>“The main reason I use it is if I have to find something desperately I’ll put a question out and get an answer within half an hour.”</i></p> <p>Tim is also aware of the use of the technology and equipment and of these technical staff members growing confidence <i>“Those guys are constantly at work, and are very busy, it’s pleasing to see they are now comfortable with what they are doing, they used to be really afraid of the potential foul-ups that could come out of their work.”</i></p>	<p>list server trust information autonomy confidence</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
29) Norm/ 88	One of the problems that some of the design team have is that they use Silicon Graphics Workstations, whereas the majority of the organisation uses standard desktop machines or laptops. The proprietary internal functionality of the email system {calendaring, special formatting, public groups, etc.) are lost when the item is read from Netscape Navigator. Attachments are a particular problem because although they have installed 'Softwindows' which allows the running of a Window 95 compatible client from within the Unix environment, the time it takes to load is enormous compared against the content that they extract from these attachments {the three line memo problem}.	
30) Melanie/ 27 Norm/ 108,160, 118	<p>"You get some of the older age group that don't have a problem with using it and others that do. I'd say it's a cultural thing."</p> <p>Melanie also commented that there was some resistance <i>"There was one guy in the tool room, I think that his log on to the computer is still "password". He's just refused point blank to use it..."</i></p> <p>Norm also mirrored this perception <i>"...You still get two types of people here, some are happy to use email and others are not...And specifically the people that don't want to use it don't tend to manage it and it becomes difficult to use"</i></p>	<p>age adoption acceptance technology culture document management continued use</p>
31) Glenn/ 12	<i>"The best people that are on it are te people that are not busy."</i>	<p>day to day use operational pressure</p>

Number) Person / segment	Statements and or Interpretations From Email And {emotion or efficiency or effectiveness or decision or organisation or legitimacy}	Keywords
		Contradiction
32) Glenn/ 14	<i>"...rather than a computer expert they were efficient on .. more efficient on computers than other people and we got onto them and could glean information out of them without feeling embarrassed and that was good as well... some of our top managers when they got the computer can't even bloody turn it on."</i>	peer support training management computer literacy
33) Glenn/ 96 Keith/	<p>Glenn suggests that the reduction in lead times and the pressures of workload have made the need for <i>"real time communication"</i> a vital business tool. He suggests that <i>"..say, have you got a problem. reply... you just type their name and that's it.. backwards and forwards. And in a couple of minutes it's done."</i></p> <p>Keith also commented on this, in that he suggested that email is synchronous with some individuals, in that they will answer quickly, while with other individuals you may only get a reply in 24 hours.</p>	synchronous asynchronous communication style workload interaction

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
34) Kiri/ 30	The site trainers use the public folders system for storing training records that can be accessed only by them. Kiri phrases their use of the folders as <i>“this is just the control of the documents”</i> . This comment reinforces the use of the public folders found in item 16) above.	public folders documents
35) Kiri/ 50,52,54	Kiri was looking for some information that she stored on the public folder system. She found many folders that were unrelated to the site and most were not accessible. She commented that <i>“they shouldn’t be visible if you can’t get into them.”</i>	visibility access intranet
36) Ruth/ 50, 52 Kiri/ 74	I asked Ruth <i>“You don’t get that personal contact with them using email?”</i> , and she responded <i>“Yes, now that I have used it more. And it’s I suppose a habit that you got into, that you rang people to talk to them, but now you email, you talk with them more..... The more you talk to people the more it’s like a conversation. You talk about things in general as well as what you are emailing them about.”</i> Here, Ruth is showing that she is accustomed to the use of email as a replacement for other conversational methods. However, later she suggested that she still liked to confront people face to face with paperwork that had not been completed correctly <i>“to stick it on there desk and say, here it is”</i>	social presence media choice

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	Kiri confirmed the replacement of the telephone with email with a similar statement <i>"You don't ring anybody anymore. You just type them an email, you know, you can guarantee it's going to get there and the persons going to read it."</i>	
37) Kiri/ 98	<i>"...you can get some nasty email, well not nasty, but when they are telling you to do something. You know it's just the way people write them."</i> Kiri is suggesting here that there is a difference in tone that is perceivable.	legitimacy
38) Tim/ 101	The predominant view of the training needs within the organisation were that there was a need for more training at many levels. Specifically, three people identified the need to provide personalised training for specific groups of employees. <i>"So instead of having a course run for everyone to use email, its so broad - sort of softened overview. Whereas it should be that, okay, you design guys are going to be trained - this is what we are going to cover and anything else you might want, I need you inputs now and then it's a real hard on, this is the area that your up to speed, these are the things will work. So it needs to be more closely defined, the needs of the user, I mean those needs with the training."</i>	training
39) Tim/	This item relates to, and fully supports, item 8) from previous search.	control responsibility feedback

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
107 Glenn/ 46	<p><i>“Yeah, I think that one of the issues is that a lot of people rely on email to say, .. to send a message and then clear it off their plate, and that’s wrong, because until you get an acknowledgement from the person that you sent the message to that they received it and understood it, and carried out whatever actions, or respond back with whatever you need then.. it can be used as an excuse that I have done my bit, and it’s all I need to do. That’s wrong. Email should be used as a convenience for contacting people, but it should be used in that order.” - Tim</i></p> <p><i>“If they send an email message, they may think that they have done the job and they are out of it. If they phone I am sure there is a reluctance to phone, but with email you don’t seem to bother. Maybe it’s the frustration of getting through ..” - Glenn</i></p> <p>The one thing that Glenn point out here that is unique, but may be help explain both this recognised behaviour and the condemnation of it, is that email is used to avoid confrontation. However, the empirical evidence summarised in these statements and in item 8 from the earlier search support the concept that avoidance of the telephone and use of email as a substitute, by the</p>	

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	weaker of traditional dyadic influential relationships, simply postpones the conflict or avoids it at the expense of creating animosity.	
40) Glenn/ 96, 98 Paul/ 30b	<p><i>“Yeah, it’s no good having all this if it is an internal tool. It’s good... but that doesn’t give us the full leverage does it. When I get frustrated when I hear ‘we haven’t got email’ and they’re behind the times. And I’m sure in six months time there will be something else that we have got, or they’ve got or we haven’t got or whatever it is, and we’ll be saying we need that. I should say, we don’t need it, but the advantage may be this, this, and this. And I believe real time communication is an advantage, it reduces all lead times or means of trends. Whether it is getting a proforma invoice out to the airport for a rush job.... and you’ve got a guy that’s got a problem and you lean on him and say, have you got a problem. reply.. you just type their name and that’s it.. backwards and forwards. And in a couple of minutes its done.”</i></p> <p>Here we have an example of where the use of email, in some cases, is treated as synchronous communication, to fill a desire for such a form of communication. Communication over email also carries with it an authority, which may be contrasted to the telephone being a non-recorded technology. However, this particular participant</p>	synchronous authority status level use

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	<p>was not a particularly organised individual with regard to retaining messages or file management. Therefore, this participant either shared a social objectification that email was recorded, or held authority for some other reason.</p> <p>The synchronicity of email is also reinforced by Paul <i>“I think it is, people have different habits, they develop different habits for using email too, some people only check their email once a day and some people have their email open all the time and they’ll be aware of notes coming in and out directly.”</i> However, when asked if this was a certain type of person Paul responded, <i>“No, it doesn’t matter where they are, there are management ... he is sitting at his desk 70-80% of the time, but he might only answer his emails once a day if I’m lucky and maybe twice a week in a worst case scenario, whereas ... I can drop him down an email and he will see it once a day without fail, ... is a shop floor guy.”</i></p>	
41) Melanie/ 25	<p><i>“The people that would use it said it was good, especially internally, it was much easier, better than trying to phone people or get hold of them, leaving little notes on their desk and stuff like that.”</i> Here, Melanie is relating using email for a collection of specific communication arrangements. Leaving notes, contacting people, talking on the phone, and <i>stuff like that</i> is</p>	<p>media genre communication task</p>

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	presumably day to day office contact. Email in this context was used in different ways depending on the given communication arrangement. Another participant talked about striking up an conversation on email, whilst another used it to disseminate a daily report from the factory. Interestingly, when I was showing some of the employees about filtering rules, the first thing they wanted to automatically delete was this daily message " <i>anything with 'the temperature today' in the body - oh neat</i> ".	

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
42) Melanie/ 43	<p><i>“A feeling I get, I guess personally, the way you turn up for meetings, but depending on how well I know the subject, it will depend on how I voice it, whereas with email, I might put a note with a whole row of question marks and send it off, and people will shoot it down as they will, and it doesn’t really matter.”</i> Melanie introduces an interesting point with offering suggestions, or group process in general. In a meeting you may be interrupted if someone believes that your suggestion is not workable or just plain silly. With email you have an opportunity to form a complete concept that may be equally unworkable, but you are able to be self critical in the same message. The order of introducing a qualitative reflection of your own argument could be an important one. Consider, “This may not work, but” as opposed to “How about this, but it may not work”. In face to face you are depreciating your own comments before you say them with the first order; however, you may not be able to complete the second order of presentation because someone has already shot you down.</p>	<p>group process decision making</p>
43) Melanie/ 85	<p>References to geographical distances arose frequently, mostly to do with convenience. The sequence of change in this organisation was geographical distribution firstly, and development of electronic communication</p>	<p>distance organisational structure</p>

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
Paul/ 57	<p>secondly. That is not to say that either caused each other, it is fairer to say in this circumstance that the two activities occurred independently.</p> <p>However, some participants perceived the arrangement to be easier with the advent of email, <i>“We are communicating more now though with the sales guys in Australia, we have more to do with them, we were pretty local but now we are starting to move more, sending stuff out to Australia and have more to do with them. And it’s easier, rather than ringing Australia, just email those sales guys, with the time zones etc. And you’ve got a record of what you’ve told them and what they’ve told you.”</i> The other issues that come from this statement are:</p> <ol style="list-style-type: none"> 1) Email helped to give a feeling of globalisation that didn’t exist with the existing communication arrangements. 2) The recorded element of email is useful in this distant geographically, and distant socially, relationship. <p>The second issue is supported by others, <i>“...the likes of who did what and what happened blah blah blah, it was very difficult to track and not just from me, from other people as well. But with email it is far more easier rather than just ring someone to actually send them an email with a copy to people that need to know ...”</i></p>	

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
44) Paul/ 57	<p><i>“But with email it is far more easier rather than just ring someone to actually send them an email with a copy to people that need to know and basically keep everyone in the loop.”</i></p> <p>Paul raises an interesting issue with this statement. Historically, if there was a communication event with a remote party, in this case the Australian operation, then the phone call would be diarised in somebody’s personal record (a diary). In this case the record is distributed and not easily replicated. Voicemail has been used to record messages, but not to record conversations over time, this was centralised and not easily replicated. Paper records and computer records were kept in a distributed manner, and were easily replicated, but not easily located. The ACT’s investigated in this study produced the best combination of each of these different communication arrangements. Using attachments on email, the communication was accessed in a distributed fashion, easily replicated, and easily recorded and accessed (depending on the file management skills of the user).</p>	<p>recorded</p> <p>distributed</p> <p>replicable</p>
45) Paul/ 61	<p>“You have to physically think about putting some of that other stuff in there. Most of the time you just write down what you’re thinking and that’s it. And you don’t - when you are speaking you</p>	<p>typing</p> <p>message construction</p>

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	<p>are actually thinking about what you are going to say and how you are going to say it. Whereas with email it is just too easy to write down...”</p> <p>Counter intuitive to my own way of thinking, this participant considers face to face communication as a more thoughtful process. This concept raises issues of cognitive processes of message construction and typing ability etc.</p>	
46) Paul/ 117	<p><i>“...if I want to preserve a conversation thread I just hit reply on the email that was sent me, I actually prefer them to reply to the email that was sent me, I actually prefer that. You end up with quite a long list on the transcript that in my mind is quite worthwhile.”</i> Email in this setting was being used for the same purpose as a discussion list server or a moderated list is used in other organisations. The Public Folders system would have been able to host a moderated discussion list, but was not enthusiastically considered. The participants preferred to use the single technology, a single point of contact. The Public Folder systems was able to be accessed through the integrated mail reader; however, even this seemed to be too much trouble for the participants.</p>	<p>discussion decision making</p>
47) Paul/ 155	<p><i>“Normally I like to consider myself as fairly diplomatic face to face, but if you have got a point to be made I normally do it through email.”</i> In this instance Paul is contrasting</p>	<p>diplomacy negotiation</p>

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	diplomacy with email, such that he is attributing email as a blunt object of persuasion.	
48) Paul/ 8b,57b	<p><i>"I don't think any of us really thought about that we now needed to take it to the next step, and present it and get feedback, and that was quite.. those of us that had thought about it had consoled ourselves to te eventuality that we were going to have to do it manually, get up in front of people, talk about it and then get a response and then take that back to the meeting. Doing it through t email, doing it through the public folder system on Outlook has a much much more efficient way of doing it that if you con just get people to provide the important feedback unfortunately email is not as in your face as a stand up presenter."</i></p> <p>In this statement Paul is comparing the task they had of summarising and preparing project work and the eventual presentation of proposals. We published some of the work on a Public Folder and invited discussion in the Folder; however, feedback was minimal and normal email and face to face feedback was predominantly used in this task.</p> <p>I asked Paul how this discussion, using email, worked compared to a face to face meeting, and his general comment was that it wasn't always</p>	<p>discussion public folders legitimacy</p>

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	<p>easy to reach a final conclusion; however, we talked about the fact that in formal meetings there is usually someone running the meeting, but that this was not always true of email discussions... <i>“Yeah, that might be true too, generally those sorts of things start off without necessarily being a meeting, they just start off with someone just trying to make a point, and in those situations there is never a dedicated moderator, you might copy it to someone like James, or someone, James is particularly bad in that he doesn’t very often respond to emails.”</i></p>	
<p>49) Paul/ 67b, 69b</p>	<p><i>“email is email as far as I’m concerned it’s just a quicker way of talking to people a getting messages to people without having to hunt them down but public folders I think, you know... if you want to publish information you put it on the public folder system and that’s where it stays. It is up to the person who needs to know to go and chase that information.”</i></p> <p>Here we have distinction between email and public folders, where the public folder system is elevated in terms of its social legitimacy. In terms fo the kind of communication that the engineering type of participant deals with on a day to day basis it is easy to see why the utility of fast dissemination of time related technical information is sought. It is also useful to include</p>	<p>information communication dissemination engineering context feedback</p>

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	<p>reference to something else that this participant said in relation to the audience for the information. <i>“I am not sure if public folders have a way of logging the number of hits so you can actually register the interest, so if you have got a document that is on the public folder that is simply not being accessed, then why bother keeping it there and keeping it maintained?”</i> In this instance the need for a technical structure that is either unavailable or difficult to use suggests that the use of the technology can be quite different from the design. The behaviour that this individual wants to mimic using the technology is where he is constructing hard copies of documents and he completes the document but doesn't mail it out to see if anyone misses it. In lieu of an obvious software alternative the participant intended to repeat this test occasionally on the ACT.</p>	
50) Paul/ 127b	<p>Related to the subject of item 8) but with a slightly different slant (<i>arse covering</i> rather than <i>buck passing</i>) Paul mentioned that <i>“..if someone receives an email out of the blue saying something really tricky like ‘confirming that blah blah blah’ on something and they recognise it as being nothing more than arse covering, whereas if you ring up that person and talk it through ... you know that they already agree, you say I’ll drop you a note confirming that. It seems to be a</i></p>	<p>media richness genre legitimacy</p>

Nb: duplication from previous search removed.

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	<p><i>much more personal way of doing it."</i></p> <p>There are a couple of important points in this statement. From a strictly media richness interpretation you can conclude that email is not as rich as the telephone. However, from a contextual and historic perspective we can determine that 'arse covering' is <i>recognised</i>, therefore it relates to a behaviour that occurred before the use of email using a different communication infrastructure. It is unlikely that the communication pattern would have changed substantially if the 'arse covering' communication had been delivered using a memorandum internally or through a business letter externally. In this context email had been used for a specific purpose, for which it was perceived to have been suited that was not negotiation or conflict resolution, rather as a political mechanism or manoeuvre.</p>	
51) Dave/ 89	<p>Dave elaborates on decision making and information gathering using email. Firstly, he suggests that email is useful because "<i>with it being written you can read it and go through it in your own pace.</i>" But he also suggests that this does not mean that you involve others in the decision process "<i>..., but also too, all of the information so quite often all you are getting is a confirmation of the conclusion that you've drawn</i></p>	<p>decision making information decision acceptance</p>

Number) Person / segment	Statements and or Interpretations From Email and Communication and {distribute or file or groups}	Keywords
		Contradiction
	<p><i>are correct.</i>” Responding to a question about involvement in decision making Dave responds “I don’t think it is wrong, not to do it with email, just do something and say what we do.”. In this case email has not changed the decision process to be one of higher involvement by all stakeholders.</p>	

References

Achterberg, J. S., van Es, G. A., & Heng, M. S. (1991). Information Systems Research in the Postmodern Period. In H. E. Nissen & H. K. Klein & R. Hirschheim (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions*: Elsevier Science publishers.

Adrianson, Lillemor, & Hjelmquist. (1991). *Group Processes in Face-to-Face and Computer-Mediated Communication*. Behaviour & Information Technology, 10(4), 281-296.

Applegate, Lynda M. (1999). In Search of a New Organizational Model: Lessons From the Field, in *Shaping Organization Form: Communication, Connection, and Community*, DeSanctis, G. and Fulk, J. (Eds.), Thousand Oaks: Sage Publications.

Ashton, T. S. (1968). *The Industrial Revolution 1760-1830 (First issued (with revisions) In Oxford Paperbacks ed.)*. Oxford: Oxford University Press.

Avison, D.E. (1996). The Search for the 'Discipline' of Information Systems. In G. McKenzie & J. Powell & R. Usher (Eds.), *Understanding Social Research: Perspectives on Methodology and Practice* (16 ed., pp. 89-100). London: Falmer Press.

Avison, D.E. (1997a). Action Research in Information Systems. In G. McKenzie & J. Powell & R. Usher (Eds.), *Understanding Social Research: Perspectives on Methodology and Practice* (16 ed., pp. 196-209). London: Falmer Press.

Avison, D.E. (1997b). The Discipline of Information Systems: Teaching, Research, and Practice. In *Information Systems: An Emerging Discipline*. Mingers, J. And Stowell, F. (Eds). London: McGraw Hill.

Avison, D., Lau, F., Myers, M., and Nielsen, P.A. (1999). *Action Research*. Communications of the ACM, Volume 42, Number 1, January.

Bakos, J. Y., & Treacy, M. E. (1986). *Information Technology and Corporate Strategy: A Research Perspective*. MIS Quarterly.

Ballard, E. G. (1982). On Dialectic: Mechanical and Human. In M. J. Hyde (Ed.), *Communication Philosophy and the Technological Age*: The University of Alabama Press.

Bannan, K.J. (2000). *Video Dresses up E-mail Ads*. The New York Times, August 24.

Banville, C. (1991). A Study of Legitimacy as a Social Dimension of Organizational Information Systems. In H. E. Nissen & H. K. Klein & R. Hirschheim (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions*: Elsevier Science publishers.

Barnes, B. (1988). *The Nature of Power*: Polity.

Barnett, G. A. (1988). Communication and Organizational Culture. In F. Jablin & L. Putman & K. Roberts & L. Porter (Eds.), *Handbook of Organizational Communication*. California: Sage Publications.

Barry, B., & Watson, M. R. (1996). *Communication Aspects of Dyadic Social Influence in Organizations: A Review and Integration of Conceptual and Empirical Developments*. Communication Yearbook, 19, 296-317.

Bartlett, D. and Payne, S. (1997). Grounded Theory - Its Basis, Rationale, and Procedures, in G. McKenzie & J. Powell & R. Usher (Eds.), *Understanding Social Research: Perspectives on Methodology and Practice* (16 ed., pp. 173-195). London: Falmer Press.

Baskerville, R., & Smithson, S. (1995). *Information Technology and New Organizational Forms: Choosing Chaos Over Panaceas*. *European Journal of Information Systems*, 4, 66-73.

Baskerville, R. L. (1997). *Distinguishing Action Research From Participative Case Studies*. *Journal of Systems and Information Technology*, 1(1), 25-46.

Benbasat, I., and Dexter, A.S. (1982). *Individual Differences in the Use of Decision Support Aids*. *Journal of Accounting Research*, 20, 1-11.

Benbasat, I. And Schroeder, R.G. (1977). *An Experimental Investigation of Some MIS Design Variables*. *MIS Quarterly*, 1(1), 37-50.

Benbasat, I., & Zmud, R., W. (1999). *Empirical Research in Information Systems: The Practice of Relevance*. *MIS Quarterly*, 23(1), 3-16.

Berg, M. (1998). *The Politics of Technology: On Bringing Social Theory into Technological Design*. *Science, Technology, and Human Values*, Volume 23, Number 4, Autumn. 456-490.

Berger, P. and Luckman, T. (1966) *The Social Construction of Reality*. Penguin Books.

Bijker, W. E., Hughes, T. P., & Pinch, T. (Eds.). (1989). *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge: MIT Press.

Birchall, D., & Lyons, L. (1995). *Creating Tomorrow's Organization: Unlocking the Benefits of Future Work*. London: Pitman Publishing.

Boshier, R. (1990). *Socio-Psychological Factors in Electronic Networking*. *International Journal of Lifelong Education*, 9(1), 49-64.

- Bradner, S.O. and Mankin, A. (1996). *IPng: Internet Protocol Next Generation*. Mass.: Addison-Wesley.
- Braun, E. (1995). *Futile Progress: Technology's Empty Promise*. London: Earthscan Publications.
- Brown, S. and Lightfoot, G. (2002). Presence, Absence, and Accountability: E-mail and the Meditation of Organisational Memory. In S.Woolgar (ed.) *Virtual Society? Technology, Cyberole, Reality*, Oxford University Press: 209-229.
- Burgess, Robert. 1993. *The Research Process In Educational Settings: Ten Case Studies*. Falmer Press, Ney York.
- Burrell, G. & Morgan, G. (1979). *Sociological paradigms and organisational analysis*. Brookfield, VT: Ashgate Publishing
- Cartwright, Alan (1999) *Code-A-Text Software For Qualitative Analysis*, Copyright © 1999 [Code-A-Text Ltd]. URL: <http://fp.codeatext.plus.com/>, Accessed 10/01/2001.
- Chenail, R. J. (1995). Presenting qualitative data. *The Qualitative Report*, 2(3). [<http://www.nova.edu/ssss/QR/QR2-3/presenting.html>]
- Chiles, A. M., & Zorn, T. E. (1995). *Empowerment in Organizations: Employees' Perceptions of the Influences on Empowerment*. *Journal of Applied Communication Research*, 23, 1-25.
- Cairncross, F. (2001) in *The Economist*, London (7 April 2001).
- Clausen, H. (1991) *Electronic Mail as a Tool for the Information Professional*. *The Electronic Library* 9, 2, April: 73-83.

Contractor, N. S., & Eisenberg, E. M. (1990). *Communication Networks and New Media in Organizations*. In J. Fulk & C. W. Steinfield (Eds.), *Organizations and Communication Technology*. California: Sage Publications.

Coyne, R. (1995). *Designing Information Technology in the Postmodern Age: From Method to Metaphor*. Cambridge: MIT Press.

Critten, P. (1999). *Coming out of the Closet - We're All Professionals Now, Continuing Professional Development, Volume 2, Issue 1*, MCB University Press.

Daft, R. L., & Lengel, R. H. (1986). *Organizational Information Requirements, Media Richness and Structural Design*. *Management Science*, 32(5), 554-571.

Davis, M. (2000). *Report: Writing a Code of Ethics by E-mail*, *Science Communication*, Volume 21, Number 4, June.

Deetz, S. (1996). *Describing Differences in Approaches to Organization Science: Rethinking Burrell and Morgan and Their Legacy*. *Organization Science*, 7(2), 191-207.

Dennis, E. E., & Pavlik, J. V. (1993). *The Coming of Convergence and its Consequences*. In J. V. Pavlik & E. E. Dennis (Eds.), *Demystifying Media Technology*. California: Mayfield Publishing Company.

DeSactis, G. and Poole, M.S. (1994) *Capturing the Complexity in Advanced Technology use: Adaptive Structuration Theory*, *Organization Science*, Volume 5, Number 2, 121-145.

Dimmick, J., Kline, S., and Stafford, L. (2000), *The Gratification Niches of Personal E-mail and the Telephone*, *Communication Research*, Volume 27, Number 2, April, 227-248.

- DiSabatino, Jennifer. (2001). *Standardizing Postmerger Email a Headache for IT*, Computerworld, April, Framingham.
- Doherty, S. (2000). *E-mail is Everywhere You Are*. Information Week, May 29, 71-72.
- Dyrud, Marilyn A. (2000). *Flaming and Thrashing: An Examination of Tone in Electronic Mail*. 30th ASEE/IEEE Frontiers in Education Conference, October 18-21, Kansas City MO, IEEE, session S3B.
- Eames, K. J. (1996). *Action Research, Dialectics and an Epistemology of Practically-Based Professional Knowledge for Education*. Unpublished PhD, Bath University.
- Eisenberg, E. M., & Riley, P. (1988). Organizational Symbols and Sense-Making. In F. Jablin & F. Putman & K. Roberts & L. Porter (Eds.), *Handbook of Organizational Communication*: Sage Publications.
- Eisenburg, E. M. (1994). *Dialogue as Democratic Discourse: Affirming Harrison*. Communication Yearbook, 17, 275-284.
- Elsbach, K. D. (1994). *Managing Organizational Legitimacy in the California Cattle Industry: The Construction and Effectiveness of Verbal Accounts*. Administrative Science Quarterly, 30, 57-88.
- The e-mail of the species*. (1996, May 11th). The Economist, 16.
- Evans, M. (1997). *An Action Research Enquiry into Reflection in Action as Part of My Role as a Deputy Head Teacher*. Unpublished PhD, Kingston University.
- Feenberg A (1989) The written world: on the theory and practice of computer conferencing. In R. Mason & A. Kaye (eds), *Mindweave: communication, computers and distance education*, Pergammon Press, Oxford, pp.22-39.

- Ferris, N. (2000). *Cleaning up Your E-mail*. Government Executive, June, U.S.A.
- Fontana, J. (2000). *E-mail Growth Hogs Enterprise Resources*. Network World, Framingham, January.
- Ford, J. D., & Ford, L. W. (1995). *The Role of Conversations in Producing Intentional Change in Organizations*. Academy of Management Review, 20(3), 541-570.
- Fulk, J., & Boyd, B. (1991). *Emerging Theories of Communication in Organization*. Journal of Management, 17(2), 407-446.
- Fulk, J., Schmitz, J., & Steinfield, C. W. (1990). A Social Influence Model of Technology Use. In J. Fulk & C. W. Steinfield (Eds.), *Organizations and Communication Technology*. California: Sage Publications.
- Fusaro, Roberta. (1998). *Mail Vendors Duke it out to be No.1*, Computerworld, August, Framingham.
- Gadamer, H-G. (1976). The Historicity of Understanding, in *Critical Sociology, Selected Readings*, P. Connerton (Ed.), Penguin Books Ltd, Harmondsworth.
- Galliers, R. D. (1991). Choosing Appropriate Information Systems Research Approaches: A Revised Taxonomy. In H. E. Nissen & H. K. Klein & R. Hirschheim (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions*: Elsevier Science publishers.
- Galvin, M. (1995). *Themes and Variations in the Discourse of Technoculture*. Australian Journal of Communication, 22(1), 62-76.
- Genosko, G. (1999). *McLuhan and Baudrillard: The Masters of Implosion*, London: Routledge.

- Giddens, A. (1979). *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis*. London: Macmillan.
- Goode, S. (2000). *Islamic Divorce Decree by E-mail*. Insight on the News: Washington, July 3 - July 10.
- Hafner, K. (2000). *For The Well Connected, All the World's an Office*. New York Times, March 30.
- Hall, S. (1996). Reflexivity in Emancipatory Action Research: Illustrating the Researcher's Constitutiveness. In *New Directions in Action Research*, Zuber-Skerritt, O. (ed), Falmer Press.
- Harrison, T.M. (1994). Communication and interdependence in democratic organizations. In S. A. Deetz (Ed.), *Communication yearbook*, 17 (pp. 247-274). Thousand Oaks, CA: Sage.
- Hearn, K. (2000). *Will US Crack Down on Rising Volume of E-mail 'Spam'*, Christian Science Monitor, Boston, April.
- Huber, G. P., & Daniel, R. R. (1986). *The Decision Making Paradigm of Organizational Design*. *Management Science*, 32(5), 572-589.
- Hult, M.; Lennung, S. (1978): *Towards a definition of Action Research: A Note and Bibliography*. In: *Journal of Management Studies*, Vol. 17, No. 2 1978, p. 241-250.
- Hurst, D. K. (1995). *A Response to "The Quest for Empowering Organizations"*. *Organization Science*, 6(6).
- Hybels, R. (1995). *On Legitimacy, Legitimation, and Organizations: A Critical Review and Integrative Theoretical Model*. Academy of Management - Best papers, proceedings.

- Hyde, M. J. (1982). Introduction: *The Debate Concerning Technology. Communication Philosophy and the Technological Age.* editor Michael J. Hyde.
- Jablonsky, S. F. (1991). Alternative Views of Quality in Information Systems Research: Discussant's Comments. In H. E. Nissen & H. K. Klein & R. Hirschheim (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions:* Elsevier Science publishers.
- Jackson, M. C. (1993). *Social Theory and Operational Research Practice.* Journal of OR Society, 44(6), 563-577.
- Jackson, M. H. (1996). *The Meaning of "Communication Technology": The Technology-Context Scheme.* Communication Yearbook, 19, 229-267.
- Jackson, S. E. (1992). *Consequences of Group Composition for the Interpersonal Dynamics of Strategic Issue Processing.* Advances in Strategic Management, 8, 345-382.
- John, S. L. (1995). *A Mid Term Reflection on the Introduction of a Competence Based Professional Studies Course at the Guernsey College of Further Education.* Unpublished MSc, University of Strathclyde.
- Kanfer, A. (1999). It's a Thin World: The Association Between Email Use and Patterns of Communication and Relationships, *Education and Outreach at the National Center for Supercomputing Applications*, http://www.ncsa.uiuc.edu/edu/trg/info_society.html, dated: 10 March 1999, accessed: 7 September 2000.
- Katz, P. (2000). *E-mail Overdue for a Facelift.* Computing Canada, May 26.
- Kaufman, D. S., & Carley, K. M. (1996). *The Influence of Print on Social and Cultural Change.* Annual Review of Applied Linguistics, 16, 14-25.

Kendall, K.E. (1997). *The Significance of Information Systems Research on Emerging Technologies: Seven Information Technologies that Promise to Improve Managerial Effectiveness*, Decision Sciences, Volume 28, Number 4, Fall.

King, R.C. and Xia, W. (1997). *Media Appropriateness: Effects of Experience on Communication Media Choice*, Decision Sciences, Volume 28, Number 4, Fall.

Klein, H. K., & Myers, M. D. (1999). *A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems*. MIS Quarterly, 23(1), 67-97.

Kling, R. and Iacono, S. (1989). *The Institutional Character of Computerized Information Systems*. Office: Technology and People, Volume 5, Number 1, 7-28.

Kling, R. (1991). *Computerization and Social Transformations*. Science, Technology, and Human Values, Volume 17, 349-365.

Kling, R. (1996). *Computerization and Controversy: Value Conflicts and Social Choices*. San Diego: Academic Press.

Kock Jr, N. F., McQueen, R. J., & Scott, J. L. (1995). *A Methodology to IS Study in Organisations through Multiple Action Research Cycles* (Research Report Series 5). Hamilton: The University of Waikato: Department of Management Systems.

Kock Jr, N. F., & Corner, J. L. (1996). *The Initiative Dilemma in Information Systems Action Research: An Empirical Negotiation Model* (Research Report Series 6). Hamilton: The University of Waikato, Department of Management Systems.

Kock Jr, N.F., Jenkins, A., and Wellington, R.J. (1996). *Critical Success Factors in Asynchronous Groupware Supported Improvement Groups: An Action Research Study*. 7th Australasian Conference on Information Systems.

Kock Jr, N. F., McQueen, R. J., & Scott, J. L. (1997). *Can Action Research Be Made More Rigorous in a Positivist Sense?: The Contribution Of an Interactive Approach*. *Journal of Systems and Information Technology*, 1(1), 1-24.

Kock Jr, N.F. (1997). Unpublished PhD thesis *The Effects of Asynchronous Groupware on Business Process Improvement*. University of Waikato.

Kock Jr, N.F. and Lau, F. (2001) *Information Systems Action Research: Serving Two Demanding Masters*, *Information Technology & People*, Volume 14, Number 1, 6-11.

Kock Jr, N. F. (2001). *The Ape That Used Email: Understanding E-Communication Behavior Through Evolution Theory*. *Communications of the Association for Information Systems*, 5(3).

Kraut, R. E., Cool, C., Rice, R. E., & Fish, R. S. (1994). *Life and Death of New Technology: Task, Utility and Social Influences on the Use of a Communication Medium*.

Kroker, A. (1992). *The Possessed Individual: Technology and Postmodernity*. London: MacMillan Press.

Lau, F. (1997). A Review on the Use of Action Research in Information Systems Studies. In A. Lee, S. & L. J. & D. J.I. (Eds.), *Information Systems Research: Information Systems and Qualitative Research* (pp. 31-68). London: Chapman & Hill.

Lardner, J. (2000). *A New Kind of E-mail The Mission Impossible Version: It Self-Destructs*, *U.S. News & World Report*, Washington, May 29.

Lea, M. (1991). *Rationalist Assumptions in Cross-Media Comparisons of Computer-Mediated Communication*. *Behaviour & Information Technology*, 10(2), 153-172.

Lee, A., S. (1999). *Rigor and Relevance in MIS Research: Beyond the Approach of*

Positivism Alone. MIS Quarterly, 23(1),

Lee, A., S. (2000). *Editor's Comments: The Social and Political Context of Doing Relevant Research*. MIS Quarterly, 24(3), v-vii.

Leidner, D. E., & Elam, J. J. (1995). *The Impact of Executive Information Systems on Organizational Design, Intelligence, and Decision Making*. Organization Science, 6(6).

Lewis, K.G. (2000). *Make E-mail your Can't Miss Salesperson*. I.Merchant, June.

Love, J.G. (1992). *A Co-evolution of Marriage and Medicine: Systemic, Constructionist, and Thematic Voices on Medical Families*. Unpublished doctoral dissertation, Nova University, Fort Lauderdale, Fl.

Lyytinen, K. (1999). *Empirical Research in Information Systems: On the Relevance of Practice in Thinking of IS Research*. MIS Quarterly, 23(1), 25-28.

Mack, A.M. (2000). *Got E-mail?*, Brandweek, New York, March 20th.

Maguire, K. *The Introduction of Information Technology to Middle Years Primary School Students: A Case Study*. Unpublished MEd, La Trobe University.

Marchand, P. (1989). *Marshall McLuhan: The Medium and the Messenger*, The MIT Press, Mass.

Markus, M. L. (1990). Toward a "Critical Mass" Theory of Interactive Media. In J. Fulk & C. W. Steinfield (Eds.), *Organizations and Communication Technology*. California: Sage Publications.

Markus, M. L., & Lee, A., S. (1999). *Special Issue on Intensive Research in Information Systems: Using Qualitative, Interpretive, and Case Methods to Study Information*

Technology - Foreward. MIS Quarterly, 23(1), 35-38.

Markus, M. L., & Lee, A., S. (2000). *Special Issue on Intensive Research in Information Systems: Using Qualitative, Interpretive, and Case Methods to Study Information Technology - Second Installment; Foreword. MIS Quarterly, 24(1), 1-2.*

Markus, M. L., & Lee, A., S. (2000). *Special Issue on Intensive Research in Information Systems: Using Qualitative, Interpretive, and Case Methods to Study Information Technology - Third Installment; Foreword. MIS Quarterly, 24(3), 473-474.*

Markus, M. L., & Robey, D. (1988). *Information Technology and Organizational Change: Causal Structure in Theory and Research. Management Science, 34(5).*

Mason, R. (1994). *Telecommunications Technologies for Teaching. Proceedings of ENB/NBS Conference "IT - supporting professional education", Edinburgh, 4-5 March.*

McLuhan, M. (1962). *The Gutenberg Galaxy: The Making of Typographic Man.* Toronto: University of Toronto Press.

_____. (1964). *Understanding Media: The Extensions of Man.* London: Routledge.

McLuhan, M., Fiore, Q., and Agel, J. (1967). *The Medium is the Massage: An Inventory of Effects.* New York: Bantam.

McLuhan, Marshall, and Eric McLuhan. (1988). *Laws of Media: The New Science.* Toronto: University of Toronto Press.

McLuhan, M., and Powers, B.R. (1989). *The Global Village: Transformations in World Life and Media in the 21st Century.* New York: Oxford University Press.

Melrose, Mary J. (2001). *Maximising the Rigour of Action Research: Why Would You*

Want To? How Could You?. Field Research, Vol 13, No 2, May, 160-180.

Minsky, B.D. and Marin, D.B. (1999). *Why Faculty Members use E-mail: The Role of Individual Differences in Channel Choice*, The Journal of Business Communication, Volume 36, Number 2, April, 194-217.

Nandhakumar, J. (1997). Issues in Participant Observation - A Study of the Practice of Information Systems Development. In G. McKenzie & J. Powell & R. Usher (Eds.), *Understanding Social Research: Perspectives on Methodology and Practice* (16 ed., pp. 210-220). London: Falmer Press.

Narayanan, V. K., & Fahey, L. (1982). *The Micro-Politics of Strategy Formulation*. Academy of Management Review, 7(1), 25-34.

Nguyen, T. and Alexander, J. (1995). The Coming of Cyberspacetime and the End of Polity. In *Cultures of Internet*, Sheilds, R. (ed).

Olaisen, J. (1991). Pluralism or Positivistic Trivialism: Important Trends in Contemporary Philosophy of Science. In H. E. Nissen & H. K. Klein & R. Hirschheim (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions*: Elsevier Science publishers.

Orlikowski, W.J. and Yates, J. (1994). *Genre Repertoire: The Structuring of Communicative Practices in Organizations*, Administrative Science Quarterly, 39, 541-574.

Orlikowski, W.J. and Yates, J., Kazuo Okamura, and Masayo Fujimoto (1994). *Shaping Electronic Communication: The Metastructuring of Technology in Use*, MIT Sloan Working Paper #3611-93, Center for Coordination Science Technical Report #155, April 1994, MIT.

Orme, J. (1997). The Case for Research into Practice. In G. McKenzie & J. Powell & R. Usher (Eds.), *Understanding Social Research: Perspectives on Methodology and Practice* (16 ed., pp. 112-123). London: Falmer Press.

Palenchar, J. (2000). *Wireless E-mail Options Continue to Grow*. Twice: New York. April.

Pateman, C. (1970). *Participation and Democratic Theory*: Cambridge University Press.

Poole, M. S., & DeSanctis, G. (1990). Understanding The Use of Group Decision Support Systems: The Theory of Adaptive Structuration. In J. Fulk & C. W. Steinfield (Eds.), *Organizations and Communication Technology*: Sage Publications.

Rathwell, M. A., & Burns, A. (1985). *Information Systems Support for Group Planning and Decision-Making Activities*. MIS Quarterly.

Reason, Peter. (1994). Three Approaches to Participative Inquiry, in *Handbook of Collaborative Research*, Sage Publications.

Rice, R., & Associates. (1984). *The New Media: Communication, Research, and Technology*: Sage Publications.

Rogers, E.M. (1986). *Communication technology: the new media in society*. New York: The Free Press.

_____, (1994). *A History of Communication Study: A Biographical Approach*, The Free Press, New York.

Ronfeldt, D. (1992). *Cyberdemocracy is Coming*. Taylor and Francis.

Rose, M.T. (1993). *The Internet Message: Closing The Book With Electronic Mail*,

New Jersey: Prentice Hall.

Sale, K. (1995). *Rebels Against The Future: The Luddites and Their War on The Industrial Revolution - Lessons For The Computer Age*: Addison Wesley Publishing Company.

Sclove, R. E. (1995a). Making Technology Democratic. In J. Brook & I. Boal (Eds.), *Resisting the Virtual Life: The Culture and Politics of Information* (pp. 85-101). San Francisco: City Lights Bookstore.

Sclove, R. E. (1995b). *Democracy and Technology*. New York: The Guilford Press.

Seidman, S. (1994). *Contested Knowledge: Social Theory in the Postmodern Era.*: Blackwell.

Shade, L. R. (1995). Is there Free Speech on the Net? Censorship in the Global Information Infrastructure, In *Cultures of Internet*, Shields, R. (ed).

Sharda, R., Barr, S.H., and McDonnell, J.C. (1988). *Decision Support System Effectiveness: A review and an Empirical Test*. Management Science, 34(2), 139-159.

Smith, S. (2000). *E-mail Etiquette*, Psychology Today, July/August.

Sproull, L., & Kiesler, S. (1986). *Reducing Social Context Cues: Electronic Mail in Organizational Communication*. Management Science, 32(11), 1492-1512.

Sproull, L., & Kiesler, S. (1991). *Connections: New Ways of Working in the Networked Organization*. Massachusetts: The MIT Press.

Staudenmaier, J. M. (1994). Rationality versus Contingency in the History of Technology. In M. R. Smith & L. Marx (Eds.), *Does Technology Drive History?: The*

- Dilemma of Technological Determinism* (pp. 261-273). Massachusetts: Massachusetts Institute of Technology.
- Sterne, J. (2000). *In Praise of E-mail*. Incorporated Technology 2000, Number 2.
- Stowell, F., West, D., & Stansfield, M. (1997). Action Research as a Framework for IS Research. In J. Mingers & F. Stowell (Eds.), *Information Systems: An Emerging Discipline* (pp. 159-200). London: The McGraw-Hill Companies.
- Stringer, E., T. (1996). *Action Research: A Handbook for Practitioners*. California: Sage Publications.
- Suchman, M. C. (1995). *Managing Legitimacy: Strategic and Institutional Approaches*. *Academy of Management Review*, 20(3), 571-610.
- Susman, G. I., & Evered, R. D. (1978). *An Assessment of the Scientific Merits of Action Research*. *Administrative Science Quarterly*, 23, 582-603.
- Teng, J.T.C. and Calhoun, K.J. (1996), *Organizational Computing as a Facilitator of Operational and Managerial Decision Making: An Exploratory Study of Managers' Perceptions*. *Decision Sciences*, Volume 27, Number 4, Fall.
- Thompson, George, A. (1997). *I Mail, We Mail, E-Mail*, HP Professional, Spring House, October, Vol. 12, Issue 10.
- Trauth, E. M., & O'Connor, B. (1991). A Study of the Interaction Between Information Technology and Society: An Illustration of Combined Qualitative Research Methods. In H. E. Nissen & H. K. Klein & R. Hirschheim (Eds.), *Information Systems Research: Contemporary Approaches and Emergent Traditions*: Elsevier Science publishers.

Tuman, M. C. (1996). *Literacy Online*. Annual Review of Applied Linguistics, 16, 26-45.

Watkins, S. C. (1995). *Social Networks and Social Science History*. Social Science History, 19(3).

White, L., & Taket, A. (1994). *The Death of an Expert*. Journal of Operations Research Society, Volume 45, Number 7, 733-748.

Whittle, David, B. (1996). *Cyberspace: The Human Dimension*. New York: W.H. Freeman and Company.

Winter, P. and Dalton, R. (2000). *E-mail is a Real Business Tool for Use Today: Specialty Screw E-mail Implementation Case History*, unpublished report from Automotive Industry Action Group, <http://www.aiag.org/map/sscase.html>, accessed 21 July 2000.

Wishart, A. (2000). *E-Love*. New Statesman, London: June 26th.

Yates, J., and Orlikowski, W.J. (1992). *Genres of Organizational Communication: A Structural Approach to Studying Communication and Media*, The Academy of Management Review, 17: 299-326.

Yates, J., Orlikowski, W.J., and Okamura, K. (1995). *Constituting Genre Repertoires: Deliberate and Emergent Patterns of Electronic Media Use*. Academy of Management Best Papers Proceedings, 55th Annual Meeting, Vancouver, Canada: August, 353-357.

Young, D.P. (1996). *The Relationship Between Electronic and Face-to-Face Communication and its Implication for Alternative Workplace Strategies*, Facilities, Volume 13, Number 6, May, MCB University Press.

Ytterstad, P., Akselen, S., and Svendsen, G. (1996). *Teledemocracy: Using Information Technology to Enhance Political Work*. *MIS Quarterly*, Volume 20(3).

Zuber-Skerritt, O. (1996). Emancipatory Action Research for Organisational Change and Management Development. In *New Directions in Action Research*, Zuber-Skerritt, O. (ed), Falmer Press.