AN ANALYSIS OF THE PROCESS OF INFORMATION SYSTEMS DEVELOPMENT ACROSS TIME AND SPACE: THE CASE OF OUTSOURCING TO INDIA

Brian Nicholson

T.I.M.E Research Institute

Information Systems Research Centre

University of Salford, Salford, UK

Submitted in Partial Fulfilment of the Requirements of the

Degree of Doctor of Philosophy, September 1999

Contents

CHAPTER THREE Theoretical Framework

CHAPTER FOUR Research Methodology

CHAPTER FIVE   The Case Study: Information Systems Outsourcing to India

CHAPTER SIX   Summary and Evaluation

List Of Figures and Tables

Acknowledgements

Declaration

The thesis draws on the following papers that have been produced during the period 1996 - 1998:

Nicholson, B. and Hughes, J. (1996) Virtual Organisations: The Future for Human Oriented Information Systems Methodology *"Proceedings of the 2nd Projectics Conference"* Bayonne, France.

Abstract

The processes of globalisation have led to a world which is more closely connected and interdependent than ever before. The use of information technology has been instrumental in facilitating these interconnections and as the processes of globalisation have unfolded, whole industries have developed which are not dependent upon location to trade with their customers across the globe. There is no industry more seemingly suited to the notion of time and place independence than software development and the relative labour costs have meant that some developing countries have become popular locations for the *outsourcing* of information systems development. There is no country more involved in the outsourcing of software than India which has rapidly emerged as a world leader in the provision of outsourced software development. There have been few studies which have holistically and longitudinally examined this form of software development as a *process*. This thesis is the result of such a study. The aim of this research is to investigate the process of information systems development across time and space involving teams located in different countries. The research is undertaken with an interpretivist approach and methodology derived from Context Process analysis. The analysis of data is informed by the sociologist Anthony Giddens's later writings on globalisation as well as theory derived from the study of culture and power in organisations. The data collection was undertaken using a range of qualitative techniques. The outcomes of the research include an improved understanding of the implications for information systems development involving teams located in different countries collaborating with information technology across time and space, with relevance to the context of Indian outsourcing. Theoretical outcomes include an improved understanding of the methodological, social and political dimensions of

information systems development using teams separated by time and space. The implications for management include an exposition of the issues involved in undertaking projects where teams are separated by time and space and guidance for moves to global software outsourcing.

CHAPTER ONE

THE AREA OF CONCERN

"I simply want to tell the story of my numerous experiments with truth...as my life consists of nothing but these experiments...I believe or at any rate flatter myself with the belief that a connected account of these experiments will not be without benefit to the reader." M.K. Gandhi *An Autobiography*

1.1 Introduction

The purpose of this chapter is to provide the reader with an overview of the context to the research and the problems and ideas which have formed a basis for this study. Central to the work which is described is an attempt to fulfil a general need in the field of information systems to consider software development when teams are separated by time, distance, culture and organisational boundaries. The extent to which the process of software development can be independent of time and space is of interest. The chapter will attempt to answer the questions of *what* the research is concerned with and a rationale as to *why* the research was undertaken. To this end, the chapter is organised as follows: consideration of the research argument, research questions and theoretical framework is followed by examination of themes of globalisation and identification of cultural dissimilarity in the "information age". Following this is a consideration of changes in the nature of work and a discussion of the globalisation of information systems (IS) development and weaknesses in current methodologies and approaches.

The final part of the chapter provides a summary and details the organisation of the thesis.

1.2 Research Argument

Avison and Wood-Harper (1990) make the point that for some the development of software and information systems has been viewed as a wholly technical endeavour. However, it is increasingly being recognised that the process contains many sophisticated issues beyond the purely technical. Jayaratna (1994), for instance, points out that IS development involves a complex interaction between the user, the analyst, the methodology, the task itself and the problem context. The scenario of information systems development becomes increasingly problematic when extended across time and space possibly involving development teams located in different countries who are from different cultural backgrounds. Interaction thus may be with "absent others" across time, space, national and cultural boundaries. The implications of managing such teams, the development methodology and the effects on the nature of work are areas considered in this inquiry. Jayaratna's (1994) analysis assumes an organisation which is operating within a "local" or national culture and it reveals a highly sophisticated set of issues within the process of IS development. Globalisation adds the dimensions of time and space, culture, cross culture and brings into question issues of identity. At a time when organisations are rushing to capture the benefits of advanced communications technology, analysis of the issues involved when teams are developing information systems across time and space is becoming extremely important. An improved exposition of the technical, managerial, methodological and social issues involved with this process is essential to understanding the medium and long term implications.

13

1.3 Theoretical Framework and Research Questions

The key exploratory research questions informing the research are:

What are the cultural and political issues involved in the process of information systems development across time and space?

How are these issues affecting the process of information systems development when teams are separated by time and space?

A broad theoretical framework combining ideas and research from organisational culture (Allaire and Firsirotu 1984, Morgan 1986), cross culture (Hofstede 1980, Sahay and Walsham 1997) and power in organisations (Morgan 1986) served as a general guide to the fieldwork. The later writings of Anthony Giddens (1990, 1991) on the implications of globalisation were also combined into the theoretical framework to assist in the process of conceptualising the findings. The inquiry is guided by the principles of interpretivist case study (Klein and Myers 1999, Walsham 1995) in the contextualist manner suggested by Walsham and Sahay (1999).

In order to commence a response to these questions, it is necessary to discuss some key debates in the context to the research issue. The following section will discuss some of the dimensions of globalisation relevant to a study of the process of information systems development across time and space. A key argument is introduced which concerns the independence of time and space which is subject to critique throughout the inquiry. A number of problematic themes are discussed in order to demonstrate the complexity of

the issues around and importance of an investigation into the process of information systems development across time and space.

1.4 Globalising Tendencies

It is interesting to consider the position in the late 1990s which according to Anthony Giddens (1990, 1991) has involved an intensification of the processes of globalisation to the point when many organisations would claim to be operating globally. On the face of it, organisation designers and managers are able to exploit information and communication technology to enable teams to collaborate independent of time and distance. Giddens (1990) describes globalisation as:

"an intensification of world-wide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa" (p64).

Although Giddens never fully engages with the importance of the use of information technology, it is fair to say that the use of IT is implicit in these developments, an obvious example being the phenomenon of social relations with absent others across time and space. For the purpose of justifying the fundamental arguments for this thesis it is important to critique the debate concerning globalisation and "one world" convergence. To accept the convergence thesis would suggest that information systems development across time and space is limited only by the capacity of technology to connect teams and individuals together. Thus the discussion will consider arguments against the idea of "cultural convergence" as an effect of globalisation. The author will

argue that far from becoming homogenous and independent of time and space, global social relations are becoming increasingly problematic.

In 1964, McLuhan famously argued that the modern media has made irrelevant the role of time and space in separating human experience and created a global village - a common global experience. It is believed by many optimistic proponents of globalisation (for example, Ohmae 1994) that the global organisation can and ought to be based on electronic technology creating a global corporate life. Following this line of argument leads to the proposition that information systems development across time and space and between cultures will eventually no longer be problematic and will thus be *independent* of time and space. This argument is simplistic as it assumes both equal access to technology and also presumes the national culture and state to be an obsolete notion in that geographical boundaries have or will lose all present relevance. Ohmae is an advocate of the idea that "cultural convergence" is taking place and the process of cultural convergence over time will largely eradicate issues of cross cultural difference. This optimistic view ignores the resilience and "embeddedness" of culture, for instance Couger (1986) reports that modern organisations are converging in terms of technology, but peoples' behaviour is continuing to display cultural dissimilarity. With regard to organisational life, Levinson and Asahi (1995) argue that many levels of culture are relevant and would need to be taken into account when considering any convergence thesis. Acceptance of the existence of national, organisational, occupational and small group culture makes the suggestion of the convergence ideal simplistic and facile. Even if organisational culture can be manipulated, Levinson and Asahi argue that national culture is more resistant. The deep "embeddedness" of structural factors such as tradition, ritual and historical background are, they argue, unique. In addition, research on cross cultural

management undertaken by Hofstede (1980) suggests that national culture shapes the nature of social structures and thus organisations.

A further stream of the cultural convergence argument concerns the "Americanisation of the globe", a thesis which rests on the assumption that the American media, products and lifestyle are gradually encroaching on other cultures and ways of life. Circumstances in 1998 led to the collapse of the economies of east Asia which demonstrated the interdependencies between countries with economic repercussions being felt around the globe. However, this does not imply that the US model of capitalism and free enterprise is becoming global, the Japanese mode of organising government and administration for instance is still vastly different to the US. Arguably, US biased global culture, the "McWorld" or "Coca-Cola" effect is reflected only in superficial symbols, consumption and of course in the media but countries still display large cultural dissimilarities. A vision of a culturally homogenised "McWorld" (Ritzer 1995) rests on the notion that once a position is achieved when all peoples wear Reebok trainers, have watched the film "Titanic" and eat at McDonalds they would be unlikely to go to war with each other. However, it is argued that the effects of globalisation lead to increased nationalism. There are currently dozens of armed conflicts going on in different parts of the world often fuelled by religious and territorial disputes and thus the "nation-state" and national culture concept is far from obsolete. It would be difficult to formulate an argument which would convince anyone that globalisation will bring together the warring factions in Yugoslavia or iron out deep rooted differences in Northern Ireland. Nations such as France for instance are taking considerable effort to ensure that the Nation State, national culture and identity are preserved. The 1998 devolution of Scotland and Wales in the UK is another example of this where nationalistic identity and a desire for independence has led to the

17

splitting of governmental structures, remarkable in so small a country as the UK. It could be argued that nationalistic tendencies are becoming stronger as nations compete in a global economy characterised by more uncertainty and pressure. Far from converging, it could be argued that people yearn for a local identity to hold out against the neutering, diluting effect on culture of superficial Americanised broadcasting (e.g. MTV etc.). Thus a strategic belief in the emergence of a common global experience is a naive view of a complex reality.

This suggests that the process of information systems development taking place across time - space is likely to be affected by a range of factors beyond that which would be encountered when participants are physically co located. The notion of time-space independence of information systems development is a highly problematic concept worthy of critique.

Another strand of the globalisation debate concerns the impact of the practice of major corporations in moving production of goods around the world usually to the cheapest centre. Harvey (1989) points out the Marxist argument of the exploitation of time and space capital. The ease with which goods are transported and disparity in labour costs around the world often means that final processing of goods in a far away country is cheaper than local production. Thus the switching of production centres is commonplace and there are numerous case studies of the exploitation of workers in sweatshop conditions producing toys and clothes for Western consumption. This argument is often countered by pointing out that multinational involvement in such countries actually contributes to the local economy and the majority of people benefit from this. However, the effect of this transience means that nothing is "rooted" in the

globalised economy. For instance, Waterford Crystal is made in the Czech republic and most of Nike footwear production is outsourced to cheap suppliers in developing countries.

This lack of "rooting" is strongly demonstrated in the ease with which information systems production is moved between centres. These centres represent major growth industries for countries such as India, Ireland and China. The exploitation of time and space capital has lead some companies to 24 hour software production by staff in different time zones and production facilities in different countries to exploit cost differential. This activity has led to the transformation of cities such as Bangalore, India which exists as India's "silicon valley" with software services a major feature. Regardless of the optimism, writers such as Madon (1997) express concern with the transformation of Bangalore. It is worth briefly examining Madon's arguments as they are relevant to the effects of the process of information systems development across time and space.

1.5 An Information Society?

According to Madon (1997) Bangalore has been fragmented by the emergence of the "information elite" who have rapidly rising salaries. There exists gross inequality between groups of different socio-economic status with extreme poverty among many inhabitants of the city. The rapid emergence of the electronics and information technology sector in Bangalore are a facet of globalisation and the impact on developing countries. Conversely, Castells (1996) makes the point that other developing countries, for instance the African republic of Chad, are largely ignored leading to inequality at a global level. These themes of inequality and fragmentation are commonly referred to in discussions concerning the "information society" and the implications of a global shift

towards informational goods and services. It is worthwhile examining some of the key themes around the information society thesis. Alvin Toffler's (1980) well known "third wave" concept is perhaps the clearest example of the idea. Toffler describes the first wave of the economy as being agricultural which lasted roughly until the eighteenth century. The industrial revolution created the industrial city, destroyed an existing job market based on the land, and set in its place a new one based on the factory. The period also led to new form of government and moves to "massification" in production. The latter day "third wave" is concerned with the "information society". Fuelled by high bandwidth telecommunications and computing together with drastically reduced size and cost of computing, information technology is steadily becoming more pervasive throughout society.

One way of differentiating the streams of literature is to consider "optimistic" and "pessimistic" strands concerning the societal impact of the "information society". Daniel Bell (1974) takes a technological determinist position and suggests that the information society will see an information economy replacing the manufacturing sector and there will be a shift in the economy to the provision of information services. Bell also argues that there will be an increased role of science and technology, and technical people will be the sources of power. The new breed of "Knowledge Workers" will be valued for what is in their heads and the old class divisions between bourgeoisie and proletariat will be replaced by a new opposition represented by the knowledge and service workers. Bell's arguments are interesting and worthy of examination in the context of India's "software factories" and whether knowledge workers will be empowered in the way he suggests. Bell argues that there will be a new social framework which will be built around the infrastructure of telecommunications, and

social and economic exchanges will be built around this infrastructure. Bell sees the computer as playing a pivotal role in this revolution.

Other authors which fall into the optimistic category include Gates (1996) and Negroponte (1995). David Lyon (1990) critiques Bell for his deterministic position and discusses the resilience of some of the familiar features of modern societies in the face of technology and also how conflicts and struggles could arise within this "information society". For instance, Lyon's analysis draws attention to the capitalist motives of big business which is unlikely to be concerned with the social implications of their endeavours in cheap labour countries. Critically, Lyon is of the belief that the optimism of Bell ignores the capacity for domination and power through surveillance, invasion of privacy, control and coercion. Lyon's critique is interesting as it provides an examination of some of the negative effects of the processes of globalisation relevant to a critique of the process of software development. The next section builds on the preceding discussion and concerns changes in the nature of work and work methods in the "information society".

1.6 Changes In The Nature Of Work

This section will consider some of the technological determinist orientation in the literature around changes in the nature of work and teleworking which argues that work is becoming *independent* of time and space. The purpose is to uncover this determinism and make a case for a wider ranging analysis of the social, cultural and political dimensions.

In considering the "office of the future", Nilles (1998) states:

"As I survey the workplace, the one, single, indisputable fact of the workplace that we can see today and that will transform the office of tomorrow is mobility of work, and of the people that do that work."

The traditional concepts of the "where" and "when" of doing work are rooted in the distant past. Before the industrial revolution agricultural workers went to fields to tend crops. After the industrial revolution workers migrated to the towns, and lived in close proximity to the factories that provided work. The pervasiveness and use of IT has undermined many of the assumptions behind this 'geographical blueprint'. However, it is argued by some (e.g. Peters 1995) that knowledge work can be *independent* of space, since communications technology allows the almost instantaneous transmission of data across world wide networks. Since work is no longer dependant on place, in some cases it is no longer dependant on time as workers can operate flexible schedules and the work itself can be done across time zones. IT is viewed deterministically as changing the fundamentals upon which organisations have based their very existence. In the same vein, Birchall and Lyons (1996) discuss recent years when IT capacity has been "catching up" with business needs, whereas today's businesses are having to catch up with IT. They describe this as a 'negative gap' (Birchall and Lyons 1996) where there is a surplus of available computing power. Exploiting this gap is, for many businesses, the key to competitive and profit advantage. This idea of a "surplus of computing power" "providing an independence of time and space" is seductive and deterministic. It hides many problems which cannot be "solved" by the application of IT and an investigation into the process aims to reveal these.

Birchall and Lyons (1996) point out that we are in the era of "knowledge workers" whose added value lies in the intelligence and knowledge they apply to the business, rather than any physical work. "Mobile workers" are said to be able to undertake work in any number of locations, thus mobile work may consist of work that can be transmitted to any part of the globe for processing. These concepts are embraced by the term 'future work' (Birchall and Lyons 1996). The abstract notion of "work" described by Birchall and Lyons (1996) is treated at a very high level and the idea of IT stripping away the task from the person and the place is seen as unproblematic. They view it as a technical problem rather than social, political or organisational.

Literature around teleworking has been of relevance to the debate on the independence of time and space in knowledge work. As early as 1976 Nilles recognised the potential for IT to substitute electronic communication for the physical commute to work. He coined the term 'telecommuter' which is still used in the USA to describe teleworkers (Nilles 1998). However, it was not until the 1980s, when convergence of inexpensive yet powerful computers, better telecommunications media, ISDN, Internet access, and lower telephone charges prompted the real growth in teleworking. At the same time, non technological factors also promoted interest in teleworking. The political climate encouraged entrepreneurial activity. Natural disasters (Los Angeles earthquake), pollution, congestion and terrorist activity (London and Manchester bombs) also focused the minds of large companies on the need to separate the ability to do work from the occupation of fixed offices.

This idea of *independence* of time and space in knowledge work is an idea which is being widely sold on a wave of technological optimism. Innovative new forms of work

such as teleworking reflect the change in cost of telecommunications and also the change in attitude to work methods. However, the trend to new forms of work extends to teams which are based in different countries with team members who do not necessarily meet face to face depending largely on IT to communicate. The globalisation of work has involved the alteration of social relations of production by means of a reorganisation of labour processes using people from different countries and time-zones.

The success stories of flexible forms of work are seductive, IBM achieved a 75% reduction in both space and costs in New Jersey by consolidating its five offices into one low cost space and adopting telecommuting strategies. AT&T's experience is similar, in 1992 the company decided to move one entire business unit, home to 10,000 account executives nation-wide, into a teleworking scheme. After 18 months, the company found it had already saved US$21 million and the account executives' customer contact had increased by 15% (Ogilvie 1994).

Despite the benefits to corporations, teleworkers operating in a national context complain of isolation, fragmentation of their role and concerns over career progression. The blurring of home work boundaries has also been seen to have negative effects on the family (Miranda 1996).

The dogma associated with "independence of time and space" in knowledge work is significant and relevant to an investigation into software development. Issues such as the tasks which require copresence and the management methods used to control the process are of interest. The next section will continue this analysis of time and space

independence in the context of software development. The most significant example of this activity concerns the expanding global software outsourcing phenomenon.

1.7 Globalisation Of Information Systems Development

This section will consider the importance of IT and software outsourcing and the fast growing industry supporting this activity across the globe. The section discusses the importance of India in this trade and builds a case for Indian outsourcing as relevant to a study into the process of software development across time and space.

Information technology outsourcing is not a new concept as it has been in existence in facilities management and time sharing deals for several decades. However, the pervasiveness, improved efficiency and reduction in cost of communications technologies has meant that European and US companies are no longer bound by their local expertise because international resources are within reach. Resource issues are also of considerable importance as many countries, for example the USA, continue to experience a shortage of experienced programmers. The increased attention given to global software outsourcing (GSO) has been popularised by the experiences of companies such as Xerox and Kodak who have internationally outsourced major pieces of their IT operations. The GSO trend is encouraging collaborative software development because unlike material goods, digital information can be transported cheaply and easily. Software development tasks can be exported abroad for advanced technological expertise or for a reduction in cost (Minoli 1995). Apte (1994) identifies two major categories of GSO and divides them into "information systems related" and "information processing related" services. The first category includes activities such as

the development and maintenance of software. The second category includes activities such as routine data entry and transaction processing. Activity can take place onsite known as "bodyshopping" which involves importing staff into the host country. Alternatively work can be undertaken offshore or in some cases a mixture of both. The common feature of all types of GSO is that activities can take place off shore as opposed to onsite.

The world-wide global software outsourcing industry is developing very quickly. McFarlan (1995) points out that a number of countries are entering into the GSO arena, such as the Philippines, China and Russia who are involved in a range of activities including large projects or sustained maintenance of legacy systems. The outsourcing of software development to off shore development companies outside the clients' home location has emerged as an important strategic option for managers. There are key benefits to be gained by multi national firms in establishing GSO arrangements in off shore sites like India, Israel and Singapore. These include improved access to global markets, access to a large pool of skilled professionals, lower labour costs and a reduced cycle time for systems development (Barret et al 1996, Heeks 1996, Willcocks et al 1995).

India remains the unquestioned leader for offshore development (McFarlan 1995). Growth of the Indian software industry is spectacular, according to India's NASSCOM (1998) the industry registered an overall growth of 58% during 1997 - 98. Future growth predictions have a solid basis as recently the Indian Government has been pressing for an integrated strategic plan for the development of IT. The plan for a "comprehensive national informatics policy" aims to "enable India to emerge as an information technology "superpower" in the next 10 years". This plan is likely to

inspire confidence in foreign companies that India will have a commitment to building and maintaining an IT infrastructure to meet their future needs. Notably in 1997-8 there were 590 leased lines providing 64 KBPS or more, in 1992 there were only 10 such links (NASSCOM 1998). With regard to software exports, analysis by NASSCOM (1998) of software destination shows that by far the biggest market for the export of software is to USA (59%) and to Europe (22%). As the communication infrastructure becomes more reliable and bandwidth increases, it is likely that many more European companies will be involved in GSO to India.

By way of examples, Singapore Airlines, Swiss Air and many other companies from different industries are moving their backroom operations to India to cut costs. The London Tube and North West Water are using software developed in India. Exporting of coding has been done for some time and it is becoming increasingly popular due to differential levels of payment, ease of data transfer and high educational standards in some developing countries (Barret et al 1996). Interestingly, due to increasing levels of trust between vendor and supplier, improvements in the reliability of communication links and affordable high bandwidth, more sophisticated work is being outsourced. However, many organisations are nervous about outsourcing important work to these far distant sites and issues of control, intellectual property, staff attrition and realising deadlines detract from the sales pitch offered by most companies selling their GSO services (McFarlan 1995).

Forecasts show that outsourcing trends are set to continue (e.g. NASCOMM) meaning that increasingly software development will be undertaken by development teams in different countries. As these companies advance up the "trust curve" more sophisticated tasks will be undertaken leading to closer collaboration (Barret et al 1997, Heeks 1996). The shortage of experienced programmers particularly in the USA and Europe has lead to

India's software market rising by more than 50% for a seventh successive year. An increasing share of exports - worth US$1.75 bn - came from companies in India serving clients abroad over high speed data links (Financial Times 10/7/98). Software services now account for more than 5% of India's export earnings and predictions for the next 5 years are as high as 25%. Offshore services accounted for 41% of exports against 5% in 1990 indicating a large and increasing amount of development taking place across time and distance (Financial Times 10/7/98). Clearly, the practice of software development across time and space is going to continue and become more important as other countries such as Sri Lanka, Pakistan, Nepal and Bangladesh enter into the market (Financial Times South Asian Software special report 1/7/98).

The next section is concerned with a discussion of the importance of development methodology, differing views on the problem of software development and the implications of time and space.

1.8 Approaches To The Process of IS Development

This section will provide some background and argument around the area of approaches to IS development. An argument is presented that the dominant paradigm adopts a technical and rational view of the process which is important to the inquiry into the process of IS development taking place across time and space.

For some time there has been a "grail - like" quest for the ultimate super methodology which has led the information systems community to witness a veritable "babble of voices" (Schon, 1983) with between 300 (Avison and Fitzgerald, 1988) and 1000

(Jayaratna, 1994) methodologies available. All of these methodologies claim to have advantages over others and jostle for position in an overcrowded, confused marketplace. The "voices" come from many directions each advocating its own philosophy which it attempts to sell as the ultimate "silver bullet" or universal approach. There are strong differences of opinion over how information systems should be developed. Wood Harper and Fitzgerald (1982) identify 6 different approaches each of which "views the world in a different way". Episkopou and Wood Harper (1986) go on to discuss the human activity, participative and data analysis approaches:

"corresponding to the 'soft', 'cybernetic' and 'rational' views identified by M.C.Jackson."

In the same paper, Episkopou and Wood Harper (1986) use the metaphor of the problem solver "changing spectacles" when switching between the world views held by particular methodologies. Therefore, the "spectacles" which are being worn by the problem solver dictate whether the project is:

"seen as a logical, technical or people problem" Avison and Wood Harper (1990).

This approach has been extended into Multiview 2 (Avison et al 1996) which attempts to incorporate even more potential perspectives. Jayaratna (1994) diversifies the debate by discussing the need for information systems practitioners to "acquire the richest possible understanding of organisations if they are to become effective problem solvers" (p61) and earlier states that "one of the major weaknesses of most current information systems methodologies is that they are not concerned with what really happens in organisations"(p58). This implies the need for consideration of approaches calling for

reflective practice (Schon 1983), greater attention to the contextual backdrop of the proposed information system. In the face of this diversity, theorists and practitioners yearn for a "discipline" of IS:

"The whole field of information systems lacks its Newton to bring it conceptual clarity" Checkland (1988).

The search for a "Newton" in IS is to some extent a straw man and masks the complexity of IS development across time and space. IS practice has been influenced strongly by its computer science parent which has moulded the dominant mode of practice in IS. The underpinnings of the youthful discipline of IS are centred on what was at its genesis considered to be the relevant theory. Lewis (1994) identifies the intellectual foundations of IS as being a combination of two primary fields, computer science and management , with supporting disciplines such as psychology, sociology, statistics, political science, economics, philosophy and mathematics (p25). This would appear to give IS a multidisciplinary feel, with influences from varied disciplines forming a coherent mix of the best of the theories from each field.

It is however worthwhile considering the enduring influences on information systems focusing on the two primary fields of influence identified by Lewis. Brady (1977) argues that since the 1950s computer science has evolved significantly into a discipline in its own right and in the area of systems development made valued contributions to, for example, the field of software engineering and safety critical systems. The term computer science implies a technical, scientific base akin to the engineering tradition and is associated with rational and instrumental reason:

"What has come to be called the 'theory' of computer science relates to studies of abstract mathematical models of computing phenomena" Brady (1977)

It is argued that mainstream IS has been influenced to a greater extent by its computer science parent (the nearest IS has to Checkland's "Newton") and has remained aloof to the richness of influence and change in the management, organisation theory and social science areas. This is profound now that the additional dimensions of time and space are added.

In the 1950's, management and computer science thought and practice was preoccupied with the tradition of rationalism, notably the American RAND corporation with its advances in systems analysis were major influences on the way early systems were built (Flood and Carson 1992). The use of hard, RAND style systems analysis has since been discredited by writers in the management area particularly when used in a social systems context displaying "wicked" problem characteristics (Rittel & Webber 1972). Ironically the hard systems paradigm is embedded in many popular lifecycle led structured information systems design methodologies such as SSADM, Information Engineering, Jackson Structured Design and DeMarco's Structured Design Methodology.

"It was perhaps inevitable then that guidance was sought from the methods of RAND style systems analysis and systems engineering...It is these that continue to influence IS thinking" (Lewis 1994 p66).

The limitations of the approach are acknowledged (Avison and Wood Harper 1990, Checkland 1981, Jayaratna 1994, Walsham 1993) however these approaches are widely used in practice partly because of ignorance of other methods, Government approbation, political protection, a feeling of "ontological security" (Wastell 1996) and the received wisdom that mathematical rigour should be the first priority (Fitzgerald 1996). If mainstream IS in the 1990's is still largely influenced by the 1950's model of positivist rationality, this implies a continuing focus on the technical aspects of development as opposed to the political or social.

The emergence of a more complex environment to systems development, rapid technological change coupled with more sophisticated users has facilitated the emergence of approaches which deal with the social and organisational aspects. The work of Mumford (1983) for instance concentrates on the human, social and job satisfaction needs as well as the obvious technical issues. These developments when coupled with the emergence and credibility of Soft Systems Methodology (Checkland 1981) and methodologies which purport to be emancipatory (Hirschheim and Klein 1994) have led to multi paradigm approaches to development using a contingency approaches. This is demonstrated in Multiview 2 (Avison et al 1996).

The implication of this is that although scientific methods still dominate IS practice, there is a recognition of the importance of the social and organisational aspects. A recognition of the essentially social nature of IS has given increased credibility to research into the social and organisational dimensions in all dimensions of IS leading to research of this nature in computer mediated communication (Orlikowski 1992a),

methodology (Hirschheim and Klein 1994) and implications of IT on society (Dunlop and Kling 1991).

To date, "human centred" methodologies for the development of information systems across time and space have not been fully formulated or documented in the IS literature. Heeks (1996) makes the point that structured methods have contributed to the success of GSO by offering a standard development approach which lends itself to a division of labour and discipline in the process. However, structured methodologies such as SSADM (Downs et al 1992) assume a physical organisation located in the same time and place. They do not take into account the complex cross cultural issues identified by authors such as Couger (1986). They also do not take into account emancipatory, job satisfaction and power issues (Fitzgerald 1996, Middleton 1994). When extended across time and space, treating information systems development as a wholly technical activity is likely to be problematic as organisations attempt to move into more sophisticated forms of relationships.

This section has identified a need to question the dominant paradigm of practice in IS given the complex global context and for a thorough exposition of the human, managerial, technical and methodological issues around information systems development taking place across time and space. The importance of methodology is profound but a growing number of authors are questioning the rigid conception of methodology. Introna (1997) for instance draws attention to the need for tacit knowledge in IS development and Schon (1983) questions the appropriateness of rigid methods faced with a "messy swampland" of professional practice.

1.9 Summary and Organisation of the Thesis

By way of summary, the discussion will focus on the *what* and *why* questions identified in the introduction. The subject of the thesis concerns information systems development which is taking place when teams are separated by time and space. The research is concerned with an analysis of the process of information systems development using the case of software outsourcing to India, an activity which is becoming increasingly important. The rationale for the research is concerned with several areas. A technical orientation towards IS development is becoming increasingly outdated given the additional dimensions imposed by the processes of globalisation. The various approaches to IS development were considered but none took into account the additional dimensions of time and space. Current practice in Global Software Outsourcing is dominated by the structured approaches which have been subject to critique. Sociologists such as Giddens identify the importance and implications of the phenomenon of globalisation and yet a view from some authors is that the process of information systems development can or shortly will become independent of time and space. This view is compounded by optimistic literature concerning changes in the nature of work and technological determinism surrounding the potential to transform work to a state of independence of time and space. This view was shown to be problematic, far from converging, societies are diverging and national identity remains strong. A further argument concerned the need for an holistic perspective of the effects of the globalisation of software development both in terms of the empowerment or otherwise of "knowledge workers" in the information society. The impact of globalisation of software development was highlighted with regard to the case of Bangalore, a city which Madon (1997) argues is ravaged by globalisation. Further chapters in the thesis are organised in the following way. Chapter two includes a literature review of relevant research. This provides the background on outsourcing,

GSO and India's software industry moving to a discussion on virtual teams, development methodology and cross cultural implications. The themes which emerged from the literature search together with initial interviews informed the choice of supporting theory in chapter three. Chapter three covers issues of the theoretical framework, culture and cross culture, power in organisations and the effects of globalisation. The chapter concludes with an initial theoretical basis. Chapter four describes and justifies the research approach examining research paradigms and methods. Chapter five provides background and analysis of the major case study involving a Mumbai based software house "Mastek" and the UK based software house "Academy Information Systems". Chapter five also contains an analysis of the case study using the framework generated in chapter four. The final chapter contains an evaluation of the thesis objectives and analysis. There is also some discussion of the implications of the research, contributions and recommendations.

CHAPTER TWO

THE GLOBALISATION OF
INFORMATION SYSTEMS DEVELOPMENT

2.1 Introduction

This chapter aims to review the literature associated with information systems development taking place across time and space. This chapter is concerned with placing the topic in context and providing an assessment of previous relevant work. This is followed in chapter three by an assessment of supporting theory and literature which has assisted in the choice of theoretical framework which is articulated therein. A purpose of this chapter is to identify the themes of investigation and lines of inquiry which informed the choice of reference theory discussed in chapter three.

To undertake this task it has been necessary to consult literature from different disciplines. The IS domain has been of use when considering software outsourcing trends and issues. Also the IS literature has been important in constructing a critique of methodological issues and the range of communication mechanisms available to facilitate team working across time and space. The literature from organisation theory has also been consulted with regard to the interest in virtual teams and virtual organisations. The theoretical literature around international management and in particular theories of cross cultural implications have been helpful in examining the

potential impact on the information systems development process using teams who are located in different countries.

```
┌─────────────────────────────────────────────────────────────────┐
│                      ┌─────────────────┐                         │
│                      │Organisation studies:                      │
│                      │culture, cross culture                     │
│                      │and power        │                         │
│                      └─────────────────┘      ┌──────────────┐   │
│  ┌──────────────┐                             │Sociology:    │   │
│  │International  │                             │modernity and │   │
│  │Management     │                             │globalisation │   │
│  │               │    ┌───────────────────┐   └──────────────┘   │
│  └──────────────┘    │An Analysis Of The Process                 │
│                      │ Of IS Development Across                   │
│                      │Time And Space: The Case Of                 │
│                      │  Outsourcing To India │                    │
│  ┌──────────────┐    │                   │        ┌────────────┐  │
│  │I S Development│    └───────────────────┘        │CMC & CSCW  │  │
│  │               │                                 │            │  │
│  └──────────────┘    ┌──────────────┐              └────────────┘  │
│                      │Outsourcing and│                            │
│                      │global software│                            │
│                      │outsourcing    │                            │
│                      └──────────────┘                            │
└─────────────────────────────────────────────────────────────────┘
```
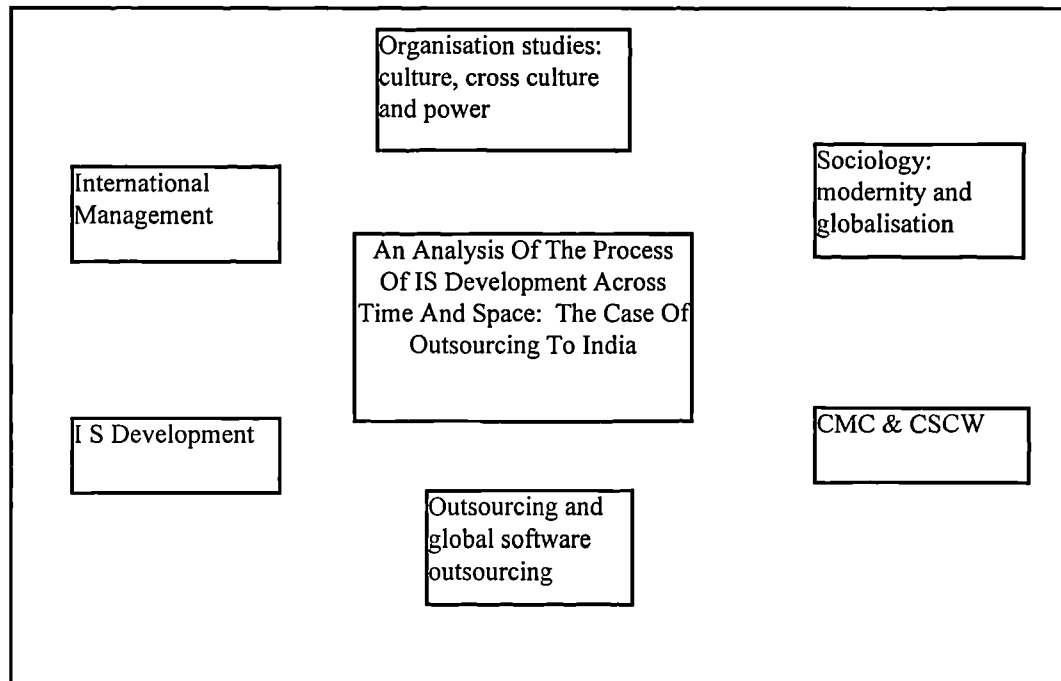
Fig 2.1 Disciplines Of Relevance To The Study

The discussion is organised as follows: firstly there is a discussion of software outsourcing and examination of the concept of outsourcing and Global Software Outsourcing (GSO) with particular regard to India's software industry. Several key papers are reviewed and a number of theoretical models introduced which attempt to categorise projects and relationships in GSO. GSO is seen as an ideal activity to study the process of information systems development across time and space and this section provides background, critique and commentary.

Following this, literature regarding Computer Mediated Communication (CMC) and Computer Supported Collaborative Work (CSCW) is reviewed including several authors' attempts to classify groupware technologies for collaboration across time and

space. This section identifies the range of communication technologies available to teams engaging in the development of software across time and space as well as a critique of theoretical frameworks for categorisation of media and their effects.

The next area reviewed is concerned with information systems and software development. The section attempts to engage with the consequences and problematic issues caused by the additional dimensions of time and space on the process of information systems development. Specifically, the section examines issues of development methodology and the implications of cross cultural information systems development. The final section reviews literature on the theme of virtual organisation.

2.2 Information Systems Outsourcing

It is possible to identify two major bodies of literature regarding outsourcing of IS. The first deals essentially with outsourcing within a firm's home country, this literature is quite extensive and reflects the importance of this area and the relative maturity of outsourcing arrangements. The second is a much smaller body of literature and deals with the outsourcing of IS to offshore companies, the practice of which is known as Global Software Outsourcing (GSO). This literature is smaller because it has only recently been technologically possible to economically and efficiently outsource software development to far distant countries. This section will review the literature around information systems outsourcing, the discussion will be concerned with issues in a national context. Two influential studies are reviewed which display the importance of issues beyond the merely technical. This is followed in section 2.3 by consideration of literature concerned with international outsourcing.

There has been a great deal of interest in issues surrounding IS outsourcing and it is worth reviewing the work of Lacity and Hirschheim (1993) and more recently Willcocks and Kern (1997). In their book on IS outsourcing, Lacity and Hirschheim (1993) identify that executives have for some time been advised by many practitioners, academics and consultants to outsource their IT services along with their cafeteria and mail delivery. This reflects a burgeoning interest in achieving efficiency and cost savings. The term "outsourcing" is overused and applies to everything from the use of contract programmers to third party facilities management. Lacity and Hirschheim provide a rough categorisation of the types of outsourcing activity from *body shopping* which often goes little further than obtaining extra contract programmers for a project, *project management* where management outsources all or part of a project to a third party and *total outsourcing* where the third party vendor is completely in charge of the project or even taking on the hardware, staff and in some cases the whole datacentre including support. Their study of 13 sites represented a variety of industries, venues and sizes and the outsourcing decisions span a variety of functions and decision outcomes. The tasks were concerned with piecemeal outsourcing of data processing and telecommunications through to consideration of outsourcing the whole IS department.

The outsourcing of "data processing" has existed for many years and can be traced back to the 1960's. However the scope of outsourcing, especially to the total outsourcing model, is a relatively new and as yet poorly understood phenomenon. Lacity and Hirschheim's approach was to interview 36 participants from the 13 companies producing a number of short case studies. These cases were informed by a theoretical framework taking into account the perspectives of power issues and cost. Their chief

concern was with understanding the organisational decision making, the costs were analysed due to an underlying economic rationale for outsourcing. The political model was selected because it "offers an alternative interpretation that focuses on power and politics". Used together these models were presumed to offer alternative ways of viewing the outsourcing phenomenon. They draw on Williamson (1975) which considers the transaction costs between monitoring an outside vendor and insourcing. The model draws on the work of Simon (1976) with its inherent rationalistic bias. To analyse the political dimension, Lacity and Hirschheim drew on Pfeffer (1981) who points out that organisational politics play a significant role in outsourcing decisions and it is necessary to consider aspects of power and political tactics in organisational decision making.

The themes from these cases produced a set of useful guidelines and recommendations aimed at managers approaching outsourcing perhaps for the first time. This approach is insightful but the case studies are short and lack depth of insight which could be gained by more in depth longitudinal study. For instance, the case studies do not form a full analysis of the process and the changing relationships over time. However, the political perspective used in this approach is interesting and at the time was a novel way of viewing outsourcing relations which are highly politically entangled. The concentration on matters of decision making though has an implicit assumption equating management with decision making. This is a characteristic of the rationalistic view of management put forward by writers such as Simon (1976). The case studies focus only on the decisions which were made with regard to outsourcing and do not provide any long term process analysis taking into account the political implications of events other than decision making. However, the interest in political dimensions to outsourcing has been

followed by others such as Kern and Silva (1998) who have further identified the importance of power issues in such relations.

The second study of outsourcing in a national context which is reviewed concerns an in depth longitudinal case study analysis of IT outsourcing at the UK inland revenue undertaken by Willcocks and Kern (1997). In a very thorough demonstration of the case study approach, this paper focused on three areas: what is outsourced; the contract and the relationship dimension. They also explored the process and management issues, this was done through the use of a framework which took into account the contractual and co-operative dimensions of the outsourcing relationship. This was used to guide data collection and informed the detailed analysis. This approach is effective and the case study raises many important issues reflecting the strengths of the in depth case study approach.

Thus, academics and practitioners are recognising the complexity of outsourcing within a national context. Some of the complexities encountered with the additional dimensions of time and space when the arrangement becomes international and thus spans the globe are reviewed in the next section.

2.3 Global Software Outsourcing (GSO)

McFarlan (1995) points out that there is an increasing trend towards outsourcing of software development and therefore a number of countries are entering into the GSO arena. He points out that as well as India and Ireland, companies in the Philippines, China and Russia are involved in a wide range of projects including large projects or sustained maintenance of legacy systems. Globalisation has provided new opportunities

for many companies. The pervasiveness, improved efficiency and reduction in cost of communications technologies has meant that companies are no longer bound by their local expertise because international resources are within reach. Use of information and communication technology has played a large part in this, McFarlan (1995) draws attention to the improvements in IT between 1992 and 1995 which he summarises as a sustained drop in the price of hardware, explosion in availability of broad band fibre networks and the internet. The increased attention given to global outsourcing issues has been popularised by the experiences of Xerox and Kodak which have internationally outsourced major pieces of their IT operations (Gupta and Raval 1999). As the technological infrastructure is put in place, technological possibilities are ahead of any understanding of the social consequences. Companies are eager to reap the economies offered by developing abroad as opposed to onsite. Therefore the main drivers behind strategic moves to GSO tend to focus on the technological possibilities, the "me too" attempt to follow Xerox and Kodak and of course the potential economic benefits. This overshadows many issues of a cultural, social and political nature which have yet to be fully investigated and understood.

The GSO trend is encouraging collaborative software development because unlike material goods digital information can be transported cheaply and easily. Software development tasks can be exported abroad for advanced technological expertise or for a reduction in cost (Minoli 1995). Another factor which has lead to GSO generally is the move towards structured methods and the burgeoning demand for ISO 9000 approval. Heeks (1995) points out that structured methods have led to an increase in deskilling and a division of labour but have contributed to overcoming risk factors and enabled more work to be done offshore (see methodology section 2.5 below).

McFarlan (1995) provides a useful categorisation of the issues involved in global software outsourcing and Heeks (1995, 1996) provides a focus on India's software industry. There is a collaborative study being undertaken by researchers at the University of Alberta and IIM Bangalore respectively which is concerned specifically with in depth longitudinal study of GSO to Bangalore. The study undertaken by Heeks in 1996 together with NASSCOM (National Association of Software and Service Companies) research on software trends still forms the basis of any thorough understanding of the pressures, trends and forces affecting India's software industry.

2.3.1 GSO to India

The Indian software industry has grown at a phenomenal rate and is now one of the top exporters of software along with Ireland, Singapore and Israel. The factors for choosing India remain powerful including a large English speaking labour pool, market opportunities; British legal system, development track record, cost differential and a good scientific education system. This has meant that increasing numbers of American and European companies are outsourcing their software development to India. In 1997 - 8, more than 158 companies out of the Fortune 500 outsourced their software to India indicating an unprecedented global outsourcing shift towards India (NASSCOM 1998). Over 100 000 people in India were dedicated to the development of software in India for the US and European markets (McFarlan 1995). India is still the favoured location for many over the major competitors of Singapore, Ireland and the newer competitors of Philippines and Russia. Table 2.2 below indicates some of the major companies who are involved in this activity:

Abbey National	Allied vans	ANZ bank	Apple
Arthur Anderson	Ashton Tate	AT & T	BT
Britannia Building	Ciba Geigy	Citibank	Consolidated Freight
Data General	Digital	Dun and Bradstreet	Fireman's Fund
HP	IBM	John Deere	KPMG
Merrill Lynch	Microsoft	North West Water	Novell
Oracle Corp	Price Waterhouse	Singapore Airlines	Swiss Air
Texas Instruments	Unisys	Verifone	Woolwich

Table 2.2 Examples Of Organisations Doing Major Development In India (McFarlan 1995)

Heeks (1995) examines the motivation of companies for Indian outsourcing and divides the factors into "push" and "pull" factors. The pull factors, shown in table 2.3, concern flexibility, cost and availability of a highly educated pool of labour. The flexibility means that companies can quickly divest excess staff but maintain their core staff thereby cutting costs and risks. The cost factor is significant, considering the cost of a client server programmer in India being roughly US$7500 compared with a similar individual in the USA who would cost US$75000 (McFarlan 1995). Since McFarlan's paper the cost differential has narrowed sharply and the author's interviews indicate roughly a third difference in price between India and UK. Also these costs narrow further when work is taking place onsite as higher rates apply as well as subsistence costs but are still regarded as around 10% cheaper than equivalent local sourcing, if available.

- reductions in costs or development time

- resources freed for strategic work

- access to new skills ideas and technology

- access to new market opportunities

- greater flexibility

Table 2.3 "Pull" Factors For GSO (Heeks 1995)

The Indian education system is excellent, the author has taught at one of the elite Indian Institutes of Management (IIM) and could not fail to be impressed with the commitment and dedication applied by students. Discussion with IIM students indicated that they perceived that there are fewer opportunities for the cream of the educational system in India than in for instance the USA which has a relatively greater number of options available which could attract top class graduates. IIM students seemed to perceive that software development is an attractive career option in India and attracts those who might have in the past opted for a career in medicine or engineering. The implication of this would be a concentration of talent heading into the software industry. Another factor is that many senior staff in Indian software houses have been educated abroad having returned home for family or other reasons and thus have experience of living and working abroad.

The "push" drivers are divided into "external" and "internal" factors. External factors for engaging in GSO include declining demand, increased competition, shortening production cycles, labour problems or even pressures from governments. Internal factors could be factors such as poor performance or new top management, new

acquisitions or a change in business direction. These "drivers" are significant in understanding management motivation for GSO to India. The next section will analyse some of the contextual factors to the process of software development within India's software industry.

2.3.2 India's Software Industry

The importance of India's software industry is subject to much press hype but the industry is still youthful. The first software products emerged from India in the mid 1970's but it was not until the 1980's when the software industry began to grow, particularly when Multi National Corporations (MNC's) began to take a serious interest in India as a centre for production of software and as a market for products. This was in the shape of wholly owned subsidiaries and contract staff both on and offshore. However, as previously stated in section 1.7 growth is now spectacular. There is a strong influence of the Indian defence and scientific establishment in promoting software development and already India's software industry is concentrated around several key "silicon cities" Bangalore, Pune, Bombay, Hyderabad and Delhi being the foremost centres. These centres are increasingly vying for position in a desire to encourage major MNC's to choose their cities / states as the chosen centre. An interesting example is the Chief Minister of Andrha Pradesh, Chandrababu Naidu who is relentlessly implementing IT into the governmental structures and is courting large companies such as Microsoft. This aggressive entrepreneurial style has enabled Naidu to be tipped for future high office and the example has been noted by his rivals.

One of the most interesting findings of NASSCOM (1998) study was that there is an increasing trend towards software development taking place in India as opposed to on site at the client location. In 1990, most work was done onsite with only 5% of work being done in India. Heeks (1995) reported that much of India's export work is carried out at the clients' site rather than offshore in India. However the most recent NASSCOM study indicates that this gap is narrowing. In 1988 approximately 75% of contracts were carried out on client sites and only 25% in India. In 1995 two thirds of all software services export earnings were formed by onsite work. NASSCOM indicate that in 1997-8, 41% of development work was undertaken in India. This is confirmed by an estimate given in Computer Weekly (Aug 22 1998 n34 pss(2)) where there is an assertion that over 70% of a given projects development is already been done in India.

Interviews with Bangalore Software Technology Parks and the European funded 3Se in July 1998 indicated that as communication infrastructure becomes more reliable and bandwidth increases to enable technologies such as video conferencing, the potential for more work to be undertaken offshore is significant. Notably in 1997-8 there were 590 leased lines providing 64 KBPS or more, in 1992 there were only 10 such links (NASSCOM 1998).

In summary then, although the size of India's software industry must be viewed in perspective, the forecast is for it to grow at very high rate (50%) leading to US$4 billion in year 2000 and possibly up to US$10 billion in 2002-3. Secondly, more work will be done offshore meaning an increased amount of work will be done across time and space. Interviews in Bangalore indicate that the nature of this work will change to more

sophisticated, early lifecycle design activity rather than the traditional division of labour with mostly coding work done in India.

This change in the nature of work is an important factor when considering the importance of aspects of development methodology, use of information and communication technologies and the social, political and cultural aspects of the development process.

2.3.3 Projects and Relationships in Indian Software Outsourcing

Heeks (1995, 1996) identifies two major types of export contract within the Indian software export industry. "Time and materials" is generally associated with contracts which provide onsite (i.e. not in India) programming services. This type of contract is charged based on how many "bodies" (i.e. staff) are used on a project and for how long. This is often referred to as "bodyshopping". The other main form of relationship is known as "turnkey" or fixed price which is where the contract is agreed in advance and the Indian company will typically be taking control of a project potentially involving all aspects of the systems development lifecycle. This usually involves an onshore / offshore mix of staff typically involving staff onsite and in India.

McFarlan (1995) discusses the types of projects which are suitable for global outsourcing. The complexity of a project increases as the project team and organisation's familiarity with the hardware, operating systems, database management and project application language decreases. A technically skilled outsourcer familiar

with these technologies can mitigate many of the risks of a project which otherwise might be too high a risk for a firm to prudently execute.

		Low structure	High structure
Low Technology	large project	poor global outsourcing candidate	good global outsourcing candidate
	small project	poor global outsourcing candidate	poor global outsourcing candidate unless part of a portfolio of projects
High technology	large project	poor global outsourcing candidate	good global outsourcing candidate if partner has the technology skills
	small project	poor global outsourcing candidate	poor global outsourcing candidate unless partner has a the technology skills and partner has the technology skills

Table 2.4 Project Types And Suitability For GSO (McFarlan 1995)

McFarlan asserts that for some projects , the nature of the task defines the processing, file structures and outputs completely from the moment of project conceptualisation. He categorises such projects as "highly structured". They are easy to outsource and carry less risk than projects whose outputs are more subject to the user managers changing judgement on desirable features. Business process re-engineering projects are given as excellent examples of low structure project where judgements and requirements are continuously changing. The outputs of highly structured projects are fixed and not likely to change during the project's life. McFarlan asserts that large highly structured projects almost irrespective of the technology can be safely developed

offshore with a high likelihood of positive results. Conversely, for projects which have elements of low structure and whose specifications are likely to evolve over time, e.g. in systems design phase of the systems lifecycle, "the geographic distance turns out to be a real problem". McFarlan advises that these projects are best done either in house or by a geographically close outsourcer.

This is a useful typology for guidance but McFarlan is not clear enough on the reasons for failure of projects in the low structure dimension other than that of "distance" and "evolving specifications". He implies that in situations where requirements are not fixed (e.g. in early lifecycle stages) then outsourcing will be problematic. Also, he provides very little guidance on managing the process of software development. This indicates that there is a need for further study of the low structure type projects and investigate what issues cause "the geographic distance to be a real problem". The author's own interviews in Bangalore during August 1998 indicated that projects involving low structure were being outsourced to Indian companies which is to some extent as a result of the improved satellite communications links in place. For instance, interviews with one company, Quidnunc, indicated an attempt to outsource low structure projects.

With regard to relationships, there are a variety of relationships between software outsourcing companies and their customers. Barret et al (1997) report on a longitudinal investigation into joint venture arrangements between several major Indian software outsourcing companies and "Global" a major North American telecommunications company. However, there are many hundreds of software companies who are engaged in relationships of varying complexity and levels of trust. Heeks (1996) details the

various types of relationship and discusses how relationships can move between categories as they mature.

Type of relationship	Trading	Informal Agency	Alliance	Joint venture	Wholly owned subsidiary
Form of outsourcing	External Outsource		Alliance outsource		Internal outsource
Model	Initial model $\longrightarrow$				Maturation model

Fig 2.5 GSO Relationship Continuum (Heeks 1995)

For Heeks, relationships are seen to move between the categories, they are progressing along a "trust curve" as the relationship "deepens" in terms of trust level and complexity of work undertaken. This model, although a useful indicator of the varying types of GSO relationships, gives the impression of a linear unidirectional movement through the stages. Also, trust is treated in a simplistic way by Heeks, trust is a very complex issue and one which is vital when teams are collaborating across time and space. The work of Anthony Giddens (1990,1991) has proved useful in providing a discussion and exposition of the issues around time, space and trust. This will be described in chapter 3. The next section will move into a discussion of the literature around the information and communication technologies which are used to allow software development teams to collaborate across time and space. This identifies what issues and theories are or may be relevant to a study of the process of software development across time and space.

2.4 Computer Mediated Communication(CMC)

This section will review the literature concerning the developments in technology for facilitating individual and group collaborative working across time and space. It will cover technologies for collaboration across time and space and discuss attempts to categorise CMC media. It will also discuss attempts to categorise theories for selection of media and understanding the effects. The reason for the inclusion of this section is to enable a discussion to take place regarding the use of particular media in the inquiry and discuss the potential implications, consequences, opportunities and effects.

In its broadest sense, CMC covers any kind of human communication involving the transmission of electronic signals between computers (Rudy, 1996). It is important to clarify some of the rather confusing terminology. The wide area of CMC could include any communication which takes place between humans via the instrumentality of computers (Herring, 1996). Thus this categorisation takes into account electronic data interchange (EDI), the internet, telephone etc. Literature concerned with computer supported collaborative work (CSCW) could be described as a subset of CMC dealing explicitly with issues surrounding *collaborative* work arrangements mediated or supported by computing technology which is sometimes referred to as "group ware". Easterbrook et al (1993) identifies the range of CMC tools available (table 2.6)

```
┌─────────────────────────────────────────┐
│  Computer Mediated Communication Tools   │
│          Textual communication           │
│          Audio communication             │
│          Video communication             │
│  Information Sharing Tools               │
│  Concept development tools               │
│  Group decision support environments     │
│  Computer supported meeting environments │
│  Collaborative writing tools             │
│                                          │
│     Table 2.6  CMC Tools                 │
│                                          │
└─────────────────────────────────────────┘
```

CMC tools include email, text conferencing, voice mail and voice conferencing and video conferencing. Information sharing tools concentrate on the ways in which the meaning of the information can be more effectively communicated and on the function of each message in the continuing dialogue between users. This includes systems designed to filter email and "The Co-ordinator" (Winograd 1988) which was designed around speech act theory to structure dialogue in a series of conversations. Concept development tools are by definition concerned with the development of concepts. At the most basic level are information sharing tools, moving to more sophisticated brainstorming tools for use by groups in, for example, initial product design. These tools are similar to group decision support tools (GDSS) but GDSS aim to produce a choice from a set of proposals whereas concept development tools will "facilitate" the user in the process of structuring problems or concepts, not usually explicit choosing. Computer supported meeting environments are physical rooms which contain a range of equipment, potentially from the whole list given above, to support a range of professional meetings requirements. Finally, collaborative writing allows concept development, brainstorming and management of the process across multiple authors.

Bullen and Bennet (1996) identify a number of systems which fall under the heading of "groupware" (see Fig 2.7). Groupware is a generic term for specialised computer aids that are designed for the use of collaborative work groups. Typically these groups are small, project oriented teams that have important tasks and tight deadlines. Sometimes groupware is used by permanent groups or departments and their interactions may be formal or informal, spontaneous or planned, structured or unstructured (Johansen 1988).

2.4.1 Place And Related Technology

Bullen and Bennet (1996) illustrate a framework for organising the various types of groupware systems. They illustrate dimensions of time and place to create four domains that describe the circumstances of interpersonal work.

- same time, same place

- same time different place

- different time, same place

- different time, different place

The evolution of this idea has lead to consideration of supporting technologies as being either *synchronous* thereby facilitating instantaneous dialogue or *asynchronous* which do not. Table 2.7 below shows the categorisation of the various technologies as supporting relevant domains of distributed work.

	same time	different time
same place	meeting facilitation	email
	group decision support	
different place	conference calls	email
	video conference	computer conference
	screen sharing	collaborative writing
	telephone	shared databases
	shared databases	
	relay chat	

Fig 2.7 Time - Place & Related Technology

The integration of some of these functions can be found in proprietary products such as Lotus Notes and the list is not exhaustive. This classification idea is useful but implies that the various technologies are only suited for particular time space situations. For instance it is quite feasible that an email conversation could take place synchronously with both participants responding immediately and potentially located in the same place. Interviews with flexible workers at Chiat Day Corporation reported that this is often the case as the mobile workers are never aware where their correspondents actually are located (BBC 2 The Business IT : Master or Slave Broadcast 1995).

2.4.2 Media Choice and Effects

This section will review literature concerned with the selection and potential effects of various CMC media. It is significant that several authors have identified that the CMC research tradition is fragmented and lacks theoretical grounding with a paucity of empirical work (Rice 1991, Rudy 1996, Steinfield and Fulk 1990). A useful review

provided by Rudy (1996) divides the literature into two broad areas that of *media choice*

and *media effects.*

Media Choice
Information richness
Social influence models
Critical mass
Interactivity
Symbolic meaning in messages and media
Media Effects
The concept of social presence
Reduced social cues
Information overload
Unforeseen effects

Table 2.8 Classification of CMC Literature (Rudy 1996)

A full examination of all of these dimensions is outside the scope of this thesis and thus

attention will be given to *information richness* in media choice, *social presence and*

social cues with regard to media effects. This is of most relevance in a study of IS

development across time and space.

1 Media Choice

Looking firstly at the domain of media choice,   the information richness model was

developed by Daft and Lengel (1984) and is defined as the potential information

carrying capacity of data. If the communication of an item of data, such as a wink,

provides substantial new understanding, it would be considered rich. If the datum

provides little understanding, it would be low in richness.

medium	richness
face to face	Highest
interactive video	High
telephone	High
voice messaging	Moderate
internet relay chat	Moderate
asynchronous email	Low

Fig 2.9 Communication and Information Richness (Daft and Lengel 1984)

Fig 2.9 contains an adaptation of the Daft and Lengel framework taking into account an updated account detailed in Birchall and Lyons (1996). The ranking of media is based on the notion of "inherent media characteristics" which make certain media more or less appropriate for particular communication tasks. These characteristics are:

facilitating feedback: richer media have instant feedback

communicating multiple cues: richer media have more cues

personal focus: richer media allow personal feelings to be communicated

Birchall and Lyons (1996) refer to the richness of media in terms of modalities of communication, modalities being the varying degrees to which different media offer auditory, visual, verbal and para verbal communication. Media can be thus ranked according to the number of modalities they support along with their relative richness.

Thus, in general a richer medium would support more sophisticated communication than a leaner medium as it is able to support fewer of the modalities.

The two major criticisms of this theory come from Markus (1994) and Lee (1994). Lee argues that the richness of communication medium is not simply a property of the medium itself but is best understood by considering the social meaning of the medium for users. This goes beyond the features and characteristics of media to the style of a manager who may or may not prefer a hands on approach to management leading to greater face to face interaction or to email based communication reinforcing status and power relations. Markus argues that adoption, use and consequences of media can be shaped by sponsorship and social control issues rather than any objective calculation of the inherent richness of the media.

2 Media Effects

With regard to media effects, the area of social presence is important. Research in this area is concerned with establishing whether media can inculcate feelings of face to face co presence and if not the extent to which they do. Research from Short et al (1976) and Walther (1992) indicates that CMC, because of its lack of visual clues, is extremely low in providing a feeling of social presence in comparison with face to face communication. Sproull and Kiesler (1986) indicate that feelings of social presence are stronger if the person is known. Leaner media provide less of a feeling of co presence. Referring once again to Birchall and Lyons (1996), the concept of modalities of communication is relevant with face to face offering full modality. Video conferencing thus is categorised as providing full modality across space and offers strong feelings of

co presence. This conclusion is corroborated by research at Europarc at Cambridge which has been equipped with a multimedia infrastructure which allows users to establish audio/visual communication with others throughout the labs controlled from their workstations. Heath and Luff (1991) report the results of a longitudinal study of the system and assert that users of the facility behave as if they were physically co present in that they, for example, echoed the postures of their colleagues. However, many non verbal cues are not noticed. This study indicates that while video communication introduces better awareness of status and disposition in a video conference, the increase is not commensurate with increase in telecommunications bandwidth required over an audio connection. Thus, the hope for high levels of social presence when using video conferencing to support software development teams could be misleading. Trust is a further consideration with regard to media effects. Giddens (1990) discusses aspects of globalisation as leading to a position where one is engaging in social relations across time and space with "absent others". Social relations are thus "disembedded" from place, the other person cannot be physically present so new forms of trust are necessary to co-ordinate activity across time and space. These topics will be dealt with in the following chapter but it is sufficient to say that trust is a significant dimension with regard to media consequences and effects.

The impact of reduced social cues is also significant. The basic issue is concerned with the impact of leaner media allowing fewer social cues to conversation : body language, intonation, laughter etc. Sproull and Kiesler (1986, 1991) have examined this notion at some length and conclude that text based forms of CMC remove the impact of status, gender and race when opening or continuing a discussion. By extension, this is believed to directly lead to a democratising effect on the organisation as it is possible for

discourse to take place without status intervention. Groupware consultant Esther Dyson refers to this process as "exposing the bullshitters and arm wavers" (Interview on Open University Groupware: So What BBC 1995) meaning that powerful persons would no longer be able to sustain face to face dominance and would be required to assert their authority and dominance using more cerebral skills. This position is critiqued by Mantovani (1994) who makes the point that the media contains no inherently democratising capabilities and cannot overcome social structures which constrain communication. For example, one can email the chairman of one's organisation but if the chairman does not read his or her email or the secretary reads it then the technology has no democratising effect. Zuboff (1988) provides case studies of computer conferences which were closed down as a result of their being perceived as subversive to the interests of management.

Some writers are of a view that text based CMC can improve the group process by removal of many points of conflict as the group becomes more task oriented. Howcroft (1998) states that text based CMC appears to be useful for certain tasks where there is a routine and purely cognitive content, and in other instance where social and emotional content is required face to face contact is appropriate. Some attempts at defining when co presence is required in group work have drawn on McGrath Group Task Circumplex (1984). Birchall and Lyons (1996) go some way in attempting to use this typology to indicate task types with the appropriate "richness" of communication technology. However seductive this might appear, the rationalistic view of the team member is overwhelmed by the potential and variation in group tasks and behaviours. Importantly, McGrath never made any strong claims about the empirical validity of the typology as it merely organised a literature search (McGrath 1984).

With regard to the implications and relevance of this literature to software development outsourced to India,   later case study analysis will show that information and communication technology use is still very basic and conservative in India given what is available in the West. The author's interviews in Bangalore in August 1998 revealed that the majority of companies are using simple file transfer and leased lines to move blocks of code between client site and offshore site. Email and telephone were also being used mainly to clarify requirements and deal with any anomalies. There are however notable exceptions. Interviews in Bangalore during 1998 indicated that Motorola and Nortel are both heavy users of video conferencing between on and offshore and have for some time being engaged in what McFarlan (1995) describes as "low structure" activity making effective use of ICT's. Reluctance of the majority of software houses to move to using more advanced ICT's is partly due to the relatively recent introduction of the software technology parks which has enabled video conferencing. Also, the use of structured development methodologies and the division of labour are established ways of working for many Indian software outsourcing companies (Heeks 1995). Involving activity in early lifecycle design work using ICT's is regarded as risky by many Indian software organisations based on responses to interviews in Bangalore in August 1998.

The analysis so far has not taken into account that software development across time and space may involve collaboration between developers from different cultures. The following section will discuss these aspects and review literature on cross cultural dimensions to CMC.

2.4.3 Cross Cultural Dimensions to CMC

The recent work of Gert Hofstede's son Geert (Dustdar and Hofstede 1998, Hofstede 1996, 1997) has concentrated on specific issues of cross cultural communication using various ICT's. Hofstede (1996) reports on a controlled experiment which was performed by groups who play acted different national cultures guided by the typologies identified by Hofstede (1980).

The work of Hofstede (1980) differentiates between national cultural characteristics by identifying key features of particular cultures represented as dimensions (reviewed in detail in the following chapter). The experiment shown in Hofstede (1997) had the set up of a business game and participants were divided up into groups that enacted the cultural characteristics of various cultural groups and played the role of national subsidiaries involved in strategic decision making. The research has continued guided by the objective of providing practical guidance regarding selection of communication technologies for a cross cultural virtual team. Four further games and design tasks have been undertaken with teams in different countries collaborating using email and the world wide web. Most recently, Dustdar and Hofstede (1998) have examined issues of video conferencing across cultures. Fig 2.10 below summarises their findings.

Culture	Implications for videoconferencing	
Dimensions of culture	Low	High
power distance	"wish to interrupt" icon for listener that floor holder can choose to acknowledge or disregard	show people's responsibilities. privilege of floor granting
individualism	enhance video quality, provide background for participants	allow side chatting
masculinity		Possibilities for non verbal displays of strength are limited have a formal protocol

Table 2.10 Implications Of Culture For Floor Control Policies

This work is interesting because it is a direct attempt to alter the technological possibilities available to participants to match the cultural make up of the group. So for instance with regard to power distance, where it is categorised as being "low" (e.g. in USA), a tendency for interruptions is likely to occur which can be obviated by adding a feature allowing participants to signal their desire to interrupt rather than the facilitator experiencing loss of control. Where power distance is high (e.g. India), Hofstede asserts that the position of participants is needed to be known by others involved in the conference and granting of the floor to those in positions of authority is required. Thus, technological mechanisms have been suggested to mediate the video conference according to cultural characteristics.

By way of critique, this work is at an early stage but as further discussed in chapter 3, Hofstede's approach in these various studies is rationalistic and displays a crude,

deterministic view of national culture. It lacks subtlety, common experience tells us that society is made up of many sub cultures which can drastically oppose the stereotypes described. The experimental methodology has been subject to critique elsewhere in this thesis. Markus' (1994) critique of CMC discussed above is also equally relevant here as Hofstede's implication that the medium has inherent capability to support cross cultural factors ignore power issues in supporting managers' political aspirations with the interaction. However, Hofstede is directly engaging with these issues and his findings and hypothesis at least allow researchers from other traditions using different reference theory to be alerted to and engage with these cross cultural dimensions.

The next section will move the discussion forward to analyse the key aspect of the process of software development, that of development methodology.

2.5 Software and Information Systems Development Across Time and Space

This section will build on the discussion and broad arguments concerning the dominant paradigm of IS development opened in chapter one. A review of literature has revealed authors who question the dominant techno rationalist paradigm of IS development. The discussion moves to considering some of the problems of IS methodology in the context of IS development across time and space. A review of literature concerning the implications of cross cultural differences on the process of software development directly engages with the consequences of globalisation on the process of IS development.

2.5.1 IS Development Methodology

"Software development" is typically viewed as an activity commonly associated with coding and programming, the latter parts of the information systems development process. "Information systems" development conversely is open to wide definition and speculation. It is important to make clear what is meant by the terms and discuss key debates. The nature of the "discipline" of information systems has for some time been an issue. Perceptions are often coloured by an understanding of IS development as being either a logical, mathematical, engineering or social systems activity. Jayaratna (1994) widens the definition:

"Information systems is concerned with a much wider domain than the mere application of information technology. It can be defined as a discipline that embraces information technology (means) information activities (role tasks and functions) and organisational activities (context)".

Following this line of argument, there is a distinction between the formal and informal information system, the organisational context and the enabling technology (networks, email, groupware etc.). The IS development lifecycle (shown in 2.11) demonstrates the progression of activities. Software development is regarded as a subset of the activity of IS development and is relegated to the latter parts of the systems lifecycle, the coding and testing activity. The lifecycle is not the only approach to IS development, broadly there exist two major paradigms within IS development which are divided into "human centred" and "formalised" methodologies for information systems development.

Human centred methodologies are divided into the categories of participative and human activity. Following Wood Harper and Fitzgerald (1982), *participative* methodologies are those which are typified by approaches such as the socio technical design in Mumford's Effective Technical and Human Implementation of Computer Systems (ETHICS) (Mumford 1983). *Human activity systems* methodologies are typified by Checkland's (1981) Soft Systems Methodology (SSM), modified for IS development by Lewis (1994). Formalised methodologies are those methods which take a rational view of IS development underpinned by a positivist epistemology and realist ontology. This is typified by methodologies such as Structured Systems Analysis and Design Method (SSADM) (Downs et al 1992), and the formal engineering and mathematical approaches (Boehm 1976). As discussed in chapter one, structured methods assume a traditional static and rational organisation and largely ignore issues of power, politics and creation of shared understanding (Fitzgerald 1996, Middleton 1994).

Moving to a consideration of the use of methodology for software development across time and space, some authors regard the liberal aims of participative approaches to be desirable in this context. The additional freedom, job satisfaction, trust and co-operation (rather than coercion) is seen as fundamental to success in "virtual" organisations (Handy 1995). Many authors accept that a new management paradigm is needed for dynamic network forms of organisation (Birchall & Lyons 1996, Handy 1995). The recurrent themes of management by trust and autonomy would suggest the appropriateness of IS development methodology which prescribes ethical, humanitarian development. Mumford's emancipatory ETHICS methodology aims to ensure new systems are acceptable to users by focusing on efficiency and job satisfaction and enabling users to play a role in design.

The interpretivist roots of Soft Systems Methodology lead to an emphasis on the creation of a shared frame of reference which explicitly questions the cultural feasibility of proposed solutions which is important in defining and maintaining effective dialogue. When considering the use of these methodologies across time and space, particular computer mediated communication technologies may be utilised to ensure dialogue with those participants who cannot be co present face to face. However, the threat to any effective computer mediated participation is identified by Zuboff (1988), Wilson (1997) and Romm (1996) who have addressed some of the issues of email tyranny, abuse of power and privacy in electronic discussion groups and email. This analysis causes concern as to whether untrammelled communication could exist between systems developer and user if development would be undertaken across time and space.

The desire for consensus and mutual understanding is of paramount concern but under conditions of geographical displacement presents several issues and questions. Attempts to reach consensus electronically without face to face contact or via a remote facilitator could be tantamount to the removal of the ethical and philosophical rooting of either human centred approach, namely that face to face social interaction can create consensus and a shared frame of reference.

Authors critical of structured approaches point out the weaknesses with regard to job satisfaction interests (of developers and users) and the limited attention to political and cultural issues, developing trust, co-operation and end user autonomy (Fitzgerald 1996, Middleton 1994, Wastell 1996). Thus when IS development is taking place across time and space using structured formal approaches actors may not be sensitised to these

softer aspects of the development process focussing instead on the technical issues. Treating systems development as a purely technical process is a "recipe for disaster" (Hirschheim and Newman 1991). If the use of human centred methodologies is problematic in part due to the geographical displacement, the implication for the development of IS across time and space is that there may be a reliance on formalised methodology possibly resulting in an IT infrastructure of control and not autonomy creating technological and not social environments.

When relating the above discussion to current practice in GSO to India, it is significant that the structured approaches dominate practice in most Indian software outsourcing companies (Heeks, 1995). Figure 2.11 below shows the standard "lifecycle" approach which is being adopted by most Indian software houses engaging in GSO. Heeks (1995) asserts that structured methods have been useful in enabling software development and have lead to a greater amount of work being undertaken in the offshore context. He discusses how this has lead to a "division of labour" under these circumstances in terms of a "locational division of labour" and a "skill division of labour".

Trigger	
Feasibility	
Analysis	
Design	
Coding	
Testing	
Delivery	
Maintenance	
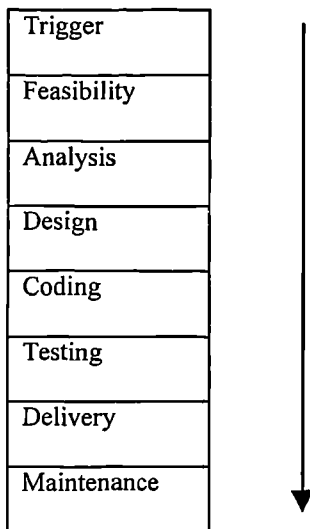
Fig. 2.11 The Software Development Lifecycle Prevalent In GSO

Very briefly (a full description is given in Lewis 1994), the trigger event is the particular problem or issue which causes an investigation starting with a feasibility study, analysis is the next stage where users consult with system designers regarding their requirements and problems with the current system. System design takes into account the work done in the previous stage and specifies the analysis using design techniques such as entity relationship modelling, data flow and structured English . The coding and software development is informed by the design followed by testing, implementation into the client site and finally maintenance of the system.

The locational division of labour in GSO refers to the level of work offshore and onsite. The amount of work done offshore is increasing as indicated earlier. However there still exists an international skill division of labour where activities in the earlier stages of the lifecycle tend to require higher levels of skill and expertise whereas those of coding and testing are less skill intensive. According to the survey quoted by Heeks (1995) at least 65% of contracts required only the provision of coding and testing services, while less

that 35% involved all stages of the lifecycle. In other words offshore Indian workers are used far more as programmers than as systems analysts or designers. They work to requirements and design specifications set by Western based software analysts. The author's interviews in 1998 indicate that this trend seems to be changing with a greater proportion of whole lifecycle projects being handled by Indian firms. Some of the biggest firms such as Wipro, Mastek and Infosys for instance now focus on large foreign companies and develop relationships involving the whole lifecycle.

In summary, the analysis has revealed problems in the process of information systems development across time and space. Software development is seen as a subset of the activity of IS development but not one that is entirely divorced from the process. In GSO, a reliance on structured development methodology has the effect of diminished participation, job satisfaction and inevitably deskills the process when the additional dimensions of time and space are added. As GSO becomes more popular and end user organisations consider the total outsourcing of company wide IS development and maintenance to Indian companies, the prevailing use of structured methods by Indian outsourcing companies may lead to a lack of attention to organisational and social concerns which would be addressed by human centred methodology. Difficulties in reaching consensus electronically reinforce the view that the process of IS development cannot be independent of time and space. The consequences of this for developers and end users are seen as significant areas of investigation within the inquiry.

2.5.2 Cross Cultural IS Development

This section will attempt to engage with another issue concerned with the additional dimension of globalisation to the process of software development, that of cross cultural issues. Many disciplines besides IS deal with the issues of cross cultural

implications and effects. Cultural psychology deals with individual differences across cultures; the organisational behaviour and general management literature deals with organisational differences; sociology and economics address societal differences. The IS area is concerned with all the multiple differences between national environments which may impact the nature of information systems. It is for this reason that the literature search for this section concentrated on the IS literature and thus theories which have been found useful in IS research (e.g. Hofstede 1980). The literature though is not extensive. Ein Dor et al (1992) found only 17 publications in the area and research undertaken after that date is limited in number. The Ein Dor et al study itself was based on a literature search and is interesting because it brings to light key national cultural variables effecting IS which are classified into three main groups: economic, demographic and socio psychological. The issues are shown in Table 2.12 below.

Economic	Psycho - sociological
level of employment	values & beliefs
average income	tradition
GNP	ceremonies & symbols
balance of trade	ideology
scope of trade	leaders
encouragement of economic	family status in firms
level of industrialisation	life style
Currency	opposition to change
natural resources	importance of job security
Demographic	employee morale
average education level	diligence and efficiency
Geography	attitudes towards technological
computer science education	interpersonal relations and
language and script	significance of concepts of
internal technical personnel	perception of concepts
	social norms

Table 2.12 National Cultural Factors In Information Systems (Ein Dor 1992)

The factors are broken down into "organisation factors", "national factors", "constant" and "changeables". The authors categorise the literature according to the various

dimensions together with general themes. One of their recommendations was a call for more case study type research partly because of the number of surveys done to date and the depth of insight from studies such as Robey and Rodriguez Diaz (1989). Other studies outlined the importance of national culture on the systems development lifecycle. Shore and Venkatachalam (1995) identify that cross cultural characteristics can have an effect on the treatment of the systems lifecycle stages. They used Hofstede's (1980) framework of cultural variables and attempted to predict the effect of national cultural factors on the systems development lifecycle. Hofstede's work is discussed in overview in 2.4.3 and reviewed in the following chapter.

According to Hofstede (1980) India is categorised as being a "high power distance" and "low uncertainty avoidance" nation.

Requirements Planning

Little participation from end users

Users unaware of IS role in organisation

Projects designed to protect the "family"

Project ideas come from the top

Systems Design

Limited use of networking and distributed processing

Members of the development team do not interact on an equal footing

Innovation may suffer due to strong social needs

Implementation

Maintaining stability of family an important issue

Technical success more important than end user satisfaction

Limited role for post implementation audits

Table 2.13 Effect Of Culture On Systems Development Life Cycle (Shore and Venkatachalam 1995)

The analysis from Shore and Venkatachalam (1995) shown in table 2.13 provides an indication of the effects of India's national cultural factors on the systems development lifecycle activities. For instance, dealing with the "requirements planning" phase of the development lifecycle, "little participation from end users" indicates that due to high power distance, superiors would be expected to make decisions regarding their subordinates who would not question their authority. "Users unaware of IS role in organisation" also relates to this dimension that users are not fully involved or informed of the workings of the IS department. "Projects designed to protect the "family" "Project ideas come from the top" indicates once again the nature of high power distance behaviour with an authoritarian attitude to planning and a collectivist attitude to protecting the patriarch's "family".

This research is interesting because of its emphasis on the development lifecycle. However, it displays the cultural stereotyping and determinism characteristic of Hofstede's approach. The points made regarding the hierarchical nature of teams, limited end user participation and the importance of social needs in such countries as India are of some interest.

Other studies have identified that understanding cultural and national effects on the use and management of IT is vital for multi national firms (Harrison and Farn 1990, Kumar and Bjorn Andersen 1990). Nelson, Weiss and Yamazaki (1992) found end user computing profoundly different in the USA compared to Japan and Straub (1994) reports the cultural effects of selection of communications media. King and Sethi (1993) report that globally run firms often operate differing IS operations between

countries and integration of these culturally diverse systems "requires substantial understanding of local business practice and people". Keittinger, Lee and Lee (1995) report differences in definition of IS quality and stress the feasibility of global IS function measurement depends on cultural effects. Finally, Munkvold (1997) reports from 8 case studies where teams were implementing IT for collaboration in distributed organisations. They identify that:

"cultural differences are a possible cause of problems. This is related both to language barriers, and to different practices for solving problems - for example, formal, hierarchical decision making vs. informal decision-making."

Barret, Sahay and Drummond's (1996) study of cross cultural software development had a significant impact on the choice of research methodology for this investigation. They adopted a longitudinal case study approach to the study of a cross cultural workforce developing software in Jamaica. This study indicated the potential pitfalls of cross cultural software development in a longitudinal analysis of the development of a computerised insurance system. They concentrate on expatriate workers in this case an Indian software manager and Jamaican programmers working together in the same physical environment developing software. The analysis is informed by structuration theory (Giddens 1984), the major result of the analysis is related to the differences as to how the Indians and Jamaicans viewed project management and hierarchical relationships. The analysis largely confirms the categorisations of power distance identified by Hofstede (1980) particularly with regard to differences in expected levels of strictness in management style and attitude to authority. The software development project fell into severe difficulties and was eventually implemented significantly later

than planned. This failure would indicate that, in this case study, national culture appeared as a stronger influence than organisational and occupational culture in an IS context. The analysis concludes by drawing on structuration theory regarding the relationship between human action and social structure. By describing the societal conditions leading to the "mental programming" inherited from a culture, the authors explain causal factors for the failure.

Hunter and Beck (1996) chose Canada and Singapore as the basis for their study into the way in which "excellent" systems analysts are perceived. Their interest is largely whether as a result of globalisation, education and training the profession is perceived similarly in either country. The rationale for the research given is that if there are cultural differences in the way in which systems analysts perform their roles then these differences are most likely to be observable in the behaviour of excellent systems analysts. This "statement of excellence" will be related to the local culture. Fundamentally, the authors wished to investigate the conflicting hypothesis of "convergence" and "divergence" which is the idea reviewed in chapter one of this thesis that as an effect of globalisation, societies will converge and become similar. The contradictory divergence hypothesis suggests that societies will become more resilient and resistant to integration. To this aim, the authors' interviewed "audiences" (peers, systems managers, users, sponsors, clients) of systems analysts in Singapore and Canada. Using the rep grid technique and utilising the grounded theory methodology, the researchers' drew out themes from each stakeholder group and summarised the results for each country. In summary, there was evidence of convergence between the perception of Singaporean and Canadian systems analysts in that they viewed the qualities of excellence in systems analysis as similar. This is suggestive of the

emergence of a global profession. There is however strong evidence of divergence in the study with regard to perceptions of business professionals. Singapore places greater emphasis on "attitude" and "knowledge". The Canadians are reported as placing more emphasis on "communication", "plan", "investigation", "flexible" and "involve user". Further analysis of the IS professional results also shows an emphasis in Singapore on the "attitude", "knowledge", and "design" whereas Canadians emphasise "communication", "investigation", "experience", "involve user" and "delegation". Overall, the study shows IS development in Singapore as being undertaken in a different way to Canada. A technical view of development contrasts with the participative approach in Canada and supports the view that the "excellent systems analyst" is behaving very differently in these two societies. The implication is that culture touches all aspects of IS development throughout the world. IS techniques and technologies are portable across international boundaries but may be mediated by local practice and the local culture.

In summary, the work done with regard to cross cultural IS development is still embryonic and restricted to a few studies mainly done using a survey based approach with its inherent positivist basis. Reference theory such as Hofstede (1980) features in some of the studies with its scientific roots. Themes which emerge from the literature search do however indicate that there appears to be significant national cultural effects on the process of IS development. These different studies, in varying ways, emphasise the point that when the process of software development involves development staff from different nationalities, there is a need to take issues of national and organisational culture seriously into the research framework. In the words of Gupta and Raval (1999) cultural issues can "make or break an offshore project".

It is significant that Ein Dor et al (1992) call for more research of an interpretivist case study nature over longitudinal periods as this type of work shows depth of insight and analytical conclusion which is difficult to achieve using survey based approaches. This, they say, should contribute to a fuller appreciation of the list of "cultural variables".

The final section in this chapter will continue to consider wider contextual factors with particular regard to the globalisation of work and consider the relevance of literature on the area of "virtual organisation" and "virtual teams".

2.6 Virtual Organisation

Globalisation has allowed certain categories of work to be undertaken almost anywhere in the world. Some organisation theorists are referring to these arrangements as offering possibilities for "virtual" collaboration. The idea of collaboration across time and space has lead to the concept of the "virtual" organisation and "virtual" teams which has been subject to a great deal of hype. The literature on virtual organisation ranges from the mystical, futuristic and almost evangelical (for instance Peters (1995)) to the rationalistic, instrumental virtual organisation portrayed by Mowshowitz (1994). The term is confusing because writers and analysts apply the term broadly and uncritically to include all sorts of futuristic scenarios involving "cyberspace", "electronic communities" and other esoteric confusing terminology. The term is used universally to include all forms of telecommuting schemes, "hot desking", hotelling by consultants, outsourcing and even partnerships. Groupware applications, the internet and mass telecommunications are seen as the enabling technologies. For Lucas and

Baroudi (1994), IT is perceived deterministically as altering the basic assumptions of modern organisational theory and practice such as the need to group people and units together to provide for co-ordination and supervision, or the need to choose between a centralised or decentralised structure. The term, virtual organisation is widely misunderstood and the abundance of exciting virtual organisation "success stories" have created a mystique around the area. For instance Ogilvie (1994) reports that IBM achieved a 75% reduction in both space and costs in New Jersey by consolidating its five offices into one low cost space and adopting telecommuting strategies. AT&T's experience is similar, in 1992 the company decided to move to one entire business unit, home to 10,000 account executives nation-wide, into virtual offices. After 18 months, the company found it had already saved US$21 million and the account executives' customer contact had increased by 15%. Digital Equipment Company in UK adopted similar strategies with corresponding effects (BBC Brave New Work Money Programme broadcast 1995).

The academic literature presents a less rosy picture. Mowshowitz (1994) for instance presents a chilling vision of a mechanistic, functionalist virtual organisation. The vision is presented of a rational organisation operated through a highly automated "meta management" purposely and systematically scanning the marketplace for suppliers, analogous to the virtual memory of a computer. The absence of human concerns is reflected in the choice of underpinning theory:

The intellectual origins of the concept developed here lie in three disparate fields namely, computer science, foundations of mathematics and international business (Mowshowitz 1994).

The "Three Pillars of Virtual Organisation" present an Orwellian vision of a cynically deskilled world with F.W. Taylor style division of labour, predictions of mass unemployment and erosion of security and free will via commoditisation of labour and information. The organisation is seen as simple, goal seeking, highly rational and its management is characterised by Administrative Man (Simon 1976). In an interesting exchange in *The Information Society*, Walsham (1994) critiques Mowshowitz but recognises that this plausible vision of virtual organisation is of great concern as it contains "sufficient similarity with current organisational practice to be worth taking seriously". This deeply troubling yet enticing (to some) reversion to rationalistic management style portrayed by Mowshowitz is of concern to information systems development in these new forms of organisation. The organisation portrayed by Mowshowitz would lend itself to a technocratic design of IS using "hard" formal methods reinforcing an autocratic culture with employees and suppliers being cynically viewed as service providers. Mowshowitz's vision of a "virtual sweatshop" is a warning of the potential for a new managerialism.

Definitions of virtual organisation have been attempted based on limited case study information. For example, Barnatt (1994) defines the virtual organisation as the ultimate network organisation and identifies some general features: a reliance for their functioning and survival on the medium of "cyberspace" across a wide system of organisational infrastructures; no identifiable physical form and only transient patterns of employee - employer connectivity; boundaries defined and limited only by the available information technology rather than by bureaucratic rules or cumbersome contractual arrangements. Mowshowitz (1994) postulates that the virtual organisation is

more than just a special case of the network organisation and is in fact not related to any organisational structure. Maurer (1996) concurs with Mowshowitz's earlier market focused description and suggests that the major requirement for the creation and management of virtual organisation is distributed project co-ordination. This includes project planning and scheduling, execution of projects, co-ordination of tasks, resolution of competing objectives, achievement of global coherence, change propagation, communication across heterogeneous groups and maintenance of access to valid information. Globalisation has enabled the means for production to be separated from the ends, the means for fulfilling a task are stripped away from the task itself.

To clarify, the work of organisation theorists is useful in helping to differentiate structural forms such as clerical bureaucracies versus matrix organisations. Birchall and Lyons (1996) present a framework based on the seminal Miles and Snow (1986) work on network organisations. *They identify 3 ideal types of network organisation: stable, dynamic and internal network. A stable network exists when a core firm is linked* backwards and forwards to carefully chosen partners as in the case of supermarket stores linking to their suppliers by Electronic Data Interchange (EDI). The second category is known as the dynamic network where task focused teams form and disband frequently and technology is used to introduce new ways of working. The ultimate dynamic network is that of a loosely connected network of collaborative service providers, an example of which could be a Palo Alto software company who have programmers working from home, all services outsourced and sales and marketing done on the internet. The final category of network organization is the internal network where market benefits are created by having various departments within the firm buy and sell outside the firm as well as within.

Morgan (1986) describes the evolution of organisational structures from clerical bureaucracies to virtual organisations; this is shown in fig 2.14. Morgan (1993) portrays a virtual organisation using a metaphor of a "spider plant". The organisation is viewed as being like a spider plant with offshoots from the plant being associate organisations. This powerful metaphor is extended in its conception to consider the nature of the linkages within the "plant", that of the umbilical cord. The umbilical cord link in the virtual organisation is the essential information technology linkage to the associated parts of the organisation. This umbilical cord is responsible for the transference of organisational vision and values; accountabilities; resource flows; information systems and rewards.

Model 1: The rigid bureaucracy

Model 2: The bureaucracy with
a senior 'management' team

Model 3: The bureaucracy with
project teams and
task forces.

Model 4: The matrix organization

Model 5: The project
organization

Model 6: The loosely-coupled
organic network
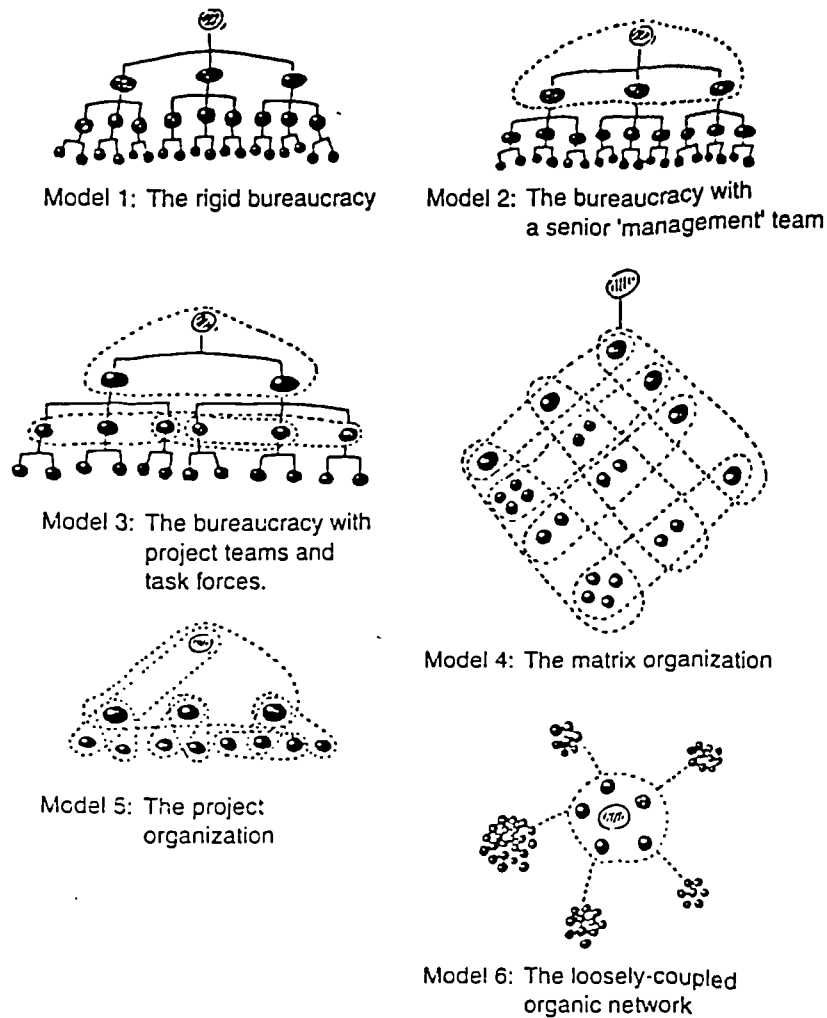
Fig 2.14 The Evolution of Organisational Structures (Morgan 1986)

The "umbilical cord dialogue" with regard to the above five factors is crucial in creating a shared frame of reference through which the parts of the "spiderplant" can operate in harmony without direct control. This is especially relevant when considering the issues of international groups and the existence of subgroups with different interests who, if not fully integrated into the remote organisational culture, may be striving for their own gain. It is necessary for the umbilical cord to propagate shared understandings as a means of creating integration while maximising the space, autonomy, and self organising capacities of the units being controlled (Morgan 1993).

2.7 Summary

The chapter firstly considered software outsourcing and the concept of Global Software Outsourcing (GSO) with particular regard to India's software industry. Following this, literature regarding CMC was examined including attempts to classify groupware technologies for collaboration across time and space. The final major area reviewed was concerned with IS development looking at issues of methodology, cross cultural systems development and the relevance of this to and within "virtual" organisations.

There are certain themes from the literature search which have informed the choice of theoretical framework and research methodology:

- Indian outsourcing is set to grow at a phenomenal rate.

- Indian organisations are starting to experiment with low structure projects and use new ICT's.

- Significant effects exist with the use of particular ICT's. This includes cross cultural effects.

- Significant cross cultural differences exist between information systems practice across cultures. This area is currently in need of further research and case study methods are deemed the most appropriate methods to investigate this (Ein Dor 1992).

- There is a dominant techno rationalist view of IS development which lends itself to a division of labour within a structured development methodology. Softer approaches are not widely used for software development between India and UK, USA etc.

- There is a great deal of excitement about virtual organisation and virtual teams.

- Power issues are significant but under researched in outsourcing arrangements.

- Process oriented longitudinal studies give the most depth in understanding power.

- The independence of time and space in information systems development is seen as problematic.

The following chapter reflects the themes and current research needs by examining theories that deal with culture, power and the additional dimension of globalisation in order to provide an initial framework for analysis.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.1 Introduction

The purpose of this chapter is to take relevant themes from the previous chapter and consider theory that would be of use in formulating the theoretical framework for the study. An initial framework for analysis is presented at the end of the chapter.

From the start the author recognised that to investigate the research question, it would not be sufficient to adopt a restrictive research agenda which would straitjacket the investigation and stifle the emergence of issues which were of importance. However, it was necessary to hone in on what supporting theory would be pertinent to understanding the political and cultural issues and the impact of globalisation on the process in order to develop a framework for analysis. The process of defining the theoretical framework and research approach taken has involved considerable introspection and detailed thought before, during and after the fieldwork. This involved discussion with colleagues and continued reading of the IS literature during the period of study which sometimes has altered the views of the author and influenced the approach. The structuring of this thesis may give the impression of a linear approach to development of the theoretical framework as follows:

research questions - framework - empirical investigation - reflection on the fieldwork - results.

This was not wholly the case. As discussed in the following chapter, the author was influenced by the work of Pettigrew (1985a, 1987) and thus was interested in the investigation of a process at various levels of analysis. The theoretical framework emerged through an ongoing dialectic in the mind of the researcher, discussion with colleagues and a series of iterations of the research question; the literature search (which was evolving during the inquiry), initial interviews at the case study location and the strengths and preferences of the author himself. This framework was constantly under review as new events emerged which may require different theories and explanatory mechanisms.

The next two chapters offer an articulation of this "journey". This chapter develops the theoretical framework by taking into consideration the literature reviewed in chapter two and subsequently critically reviewing relevant reference theory before outlining an initial theoretical basis for the investigation. Chapter four is devoted to an exposition of the practical and philosophical dimensions of the research tradition in IS and a justification of the chosen approach to support the investigation.

This chapter is organised as follows: discussion on the nature of theoretical frameworks in IS research is followed by an analysis of culture and cross culture in organisations together with consideration of power issues. Giddens's later writings on globalisation in what he terms "late modernity" are discussed. The final part of the chapter describes the initial framework to be used for analysis.

3.2 Theoretical Frameworks In IS Research

Checkland (1991) has usefully identified the process of research into the categories of Framework, Methodology and Area of application (shown in fig 3.1). With regard to the framework (F), it is commonly accepted that the development and use of a theoretical basis is helpful as a foundation and guide for the inquiry. When linked closely to the research questions, a framework is useful as a basis for data gathering and analysis strategy. It is important to note that in the context of this research the framework is conceptualised as a "learning device" or as "scaffolding" (Walsham 1995) for the exploration of events that will lead to insights into the case under investigation. It is not the author's intention to develop a rigid analytical framework in a positivist sense but to provide a guide to empirical work in the sense suggested by Walsham (1993).
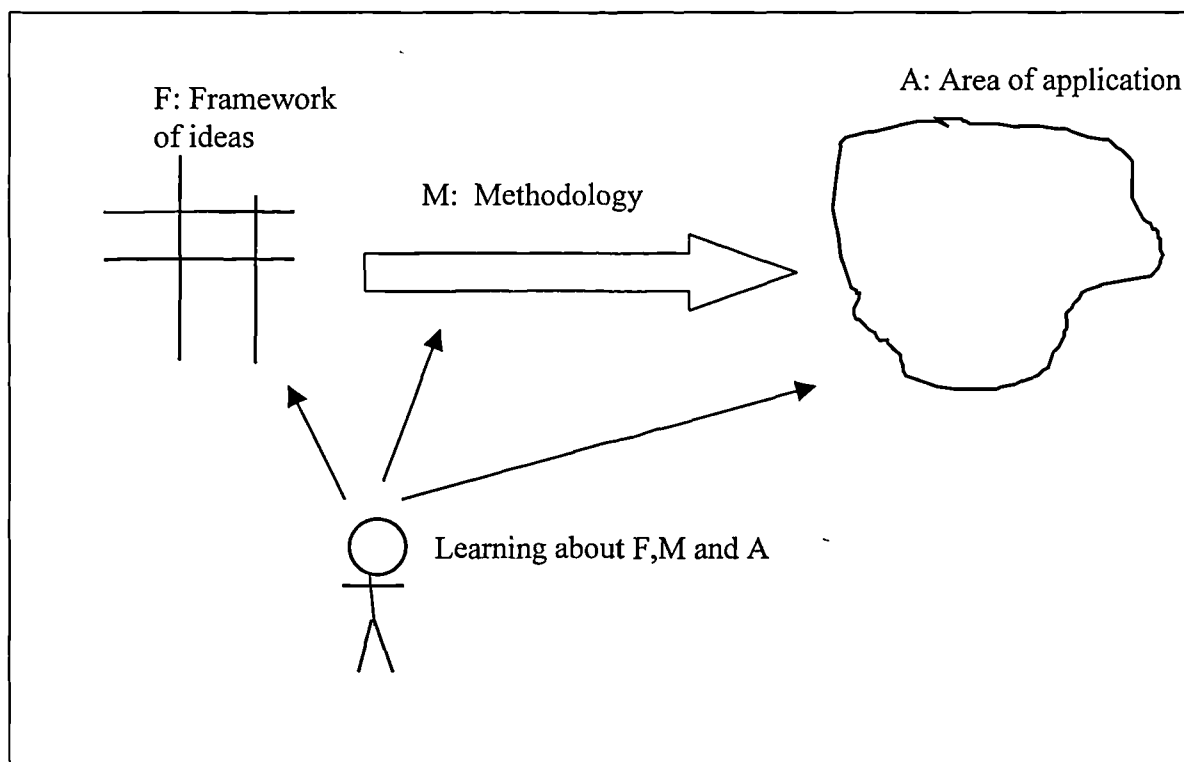
Fig 3.1 The Elements of Research (Checkland 1991)

Thus following Avison and Wood Harper (1990) the supporting theory and resulting framework for analysis is intended to be one which will be *relevant to* the process under investigation, as a *metaphor* or guide to learning within the situation and as an aid to reflexivity. It is the intention though to build an analytical framework that can be tested and enhanced following empirical work. Feedback will allow the framework to be revised accordingly.

Davis (1991) refers to the theoretical framework as a "model" but the author has resisted this term as it has rationalistic connotations and a suggestion of an instrumental treatment of data which is "run through the model" or "tested against the model". However it is of interest to consider Davis' categorisation of models. Davis asserts that a model is required so that the initial exploration can be started and goes on to identify three approaches to the use of models in research inquiry. The first approach is deductive in nature and the other two approaches inductive in their treatment of models. According to Davis (1991) the scientific approach moves from model to hypothesis to the beta tested model, the grounded theory approach moves from data to explanation to model and the exploratory approach takes a model formed as a basis for inquiry from indications in the relevant literature. The model is used as an initial basis for explanation and enhanced accordingly.

In the scientific approach the model is intended to be a model *of* the process under investigation. This assumes that the process (or system) is tangible and objective and exists physically within the world. This rationalistic view of models is commonly adopted in scientific inquiry and has largely being proved as ineffective in the social

sciences (see section 4.2 for a more detailed discussion). The research will be based on an interpretivist approach to understanding the views of the research subjects. The process is viewed as being socially constructed, that multiple perspectives and interpretations exist and need to be appreciated and understood. The results will thus be subjective, comprising the researcher's interpretation of the views and beliefs of the subjects. Thus the scientific approach to modelling can be ruled out in this case.

The grounded (Glaser and Strauss 1967) and exploratory approach (shown in for example Walsham 1993) are next to be considered. The grounded theory approach is considered valid in its inductive treatment of models and theory building from the data. However, it was significant that there were strong thematic indications in the literature search that pointed towards an exploratory approach. Also, the grounded approach prescribes systematic analysis of research data often using computer systems such as NUDIST for this purpose. In common with Walsham and Sahay (1999), the author was uncomfortable about such an analysis strategy as the reductionist formal structured method suggested by Glaser and Strauss to identify themes from field notes would, in the author's opinion, be inappropriate given the complexity of the field data. The exploratory approach takes indications in the literature which enable the formation of an initial exploratory model to begin investigation into the process. This research adopts this strategy and thus builds an initial model (or the preferred term of framework) for the investigation. However, as pointed out in the introduction, there has been an ongoing dialectic between the framework, the researcher and the case study data. Thus the formation of the framework evolved over time influenced by the indications in the literature, the author's continued reading and discussion with colleagues and changing themes and events in the case study over time.

In formulating the theoretical framework, supporting theory has been considered for the situation under investigation. This is shown in fig 3.2 below. There follows a review of the theory that has been consulted in the development of the framework which culminates in an attempt to integrate the theories in order to provide an analytical framework.

Firstly, literature around culture and cross culture is reviewed followed by theories concerned with power in organisations. Finally, theories which take into consideration the additional dimensions of time and space are discussed with regard to their usefulness in providing explanatory mechanisms for investigation into the process.

Political analysis	Culture and cross culture
Macro theory concerned with globalising tendencies	
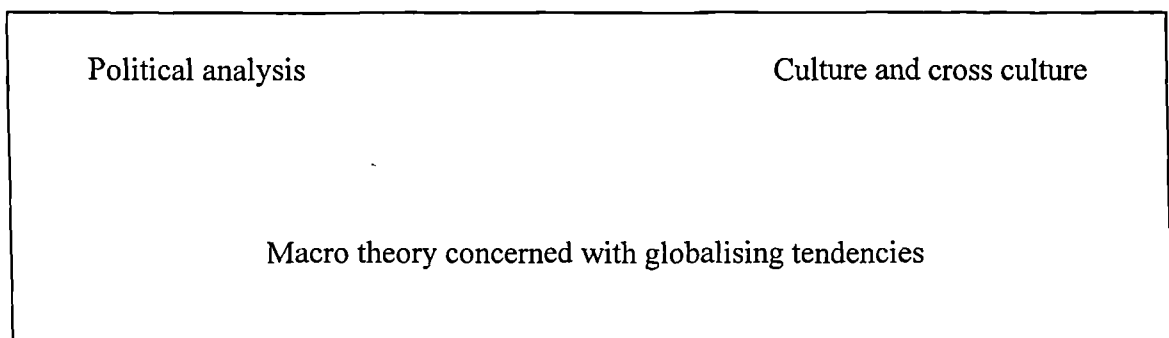
Fig 3.2 Initial Framework for Analysis

3.3 Culture and Organisations

Culture has come to be a popular subject in the popular and academic management literature (Peters and Waterman 1982, Schein 1985). Pettigrew (1979) is credited as the first theoretician who identified "organisational culture" and in effect brought the field of anthropology into the discipline of management. Interest in the importance of culture has come to be of interest to IS researchers, for instance Robey and Azevedo (1994)

provide a comprehensive review of the significance and importance of cultural analysis of the organisational consequences of information technology. Avison and Myers (1995) argue for the inclusion of anthropological concepts in IS culture research. Boland (1985, 1987) looked at the sense making process in information systems development, Feldman and March (1981) analysed information in organisation as embedded in social norms and Walsham (1993) provides an interpretive approach to information systems from a cultural perspective.

However, culture is recognised as being a "slippery" notion which is difficult to tie down and significant differences exist as to its conceptualisation. This is largely due to different views on culture and whether it can be "managed" in a rationalistic sense or whether it is much more of a "spiritual" phenomenon. Smircich (1983) provides an indication of the broad conceptualisation of culture as being something an organisation "has" and as something an organisation "is". A lot of work on culture from both the populist (Peters and Waterman 1982) and academic literature (Schein 1985) concentrates on culture as something an organisation *has*. Avison and Myers (1995) argue that this is still the prevailing view in the IS area. Peters and Waterman (1982) were influential but concentrated on manipulation of culture (so called "culture management") to contribute towards business success. The text's major premise, that of achieving control of values and beliefs, ceremonies and symbols etc. in a rationalistic manner was subject to extensive criticism. In the IS area, Davis (1991) draws on Allaire and Firsirotu's (1984) work on culture in organisations and provides a "model" for analysing culture. The categories are summarised in Fig 3.3. These criteria are characteristic of approaches to understanding culture as something an organisation "has."

External Factors

Society

History

Individual actor factors

level of knowledge

needs

motives

experience

weltenshauungen

Process: Socio Structural Factors

Structures

Strategies

Policies

Processes

Symbolic factors

rites, rituals, customs

metaphors slogans

glossaries

stories

design

architecture
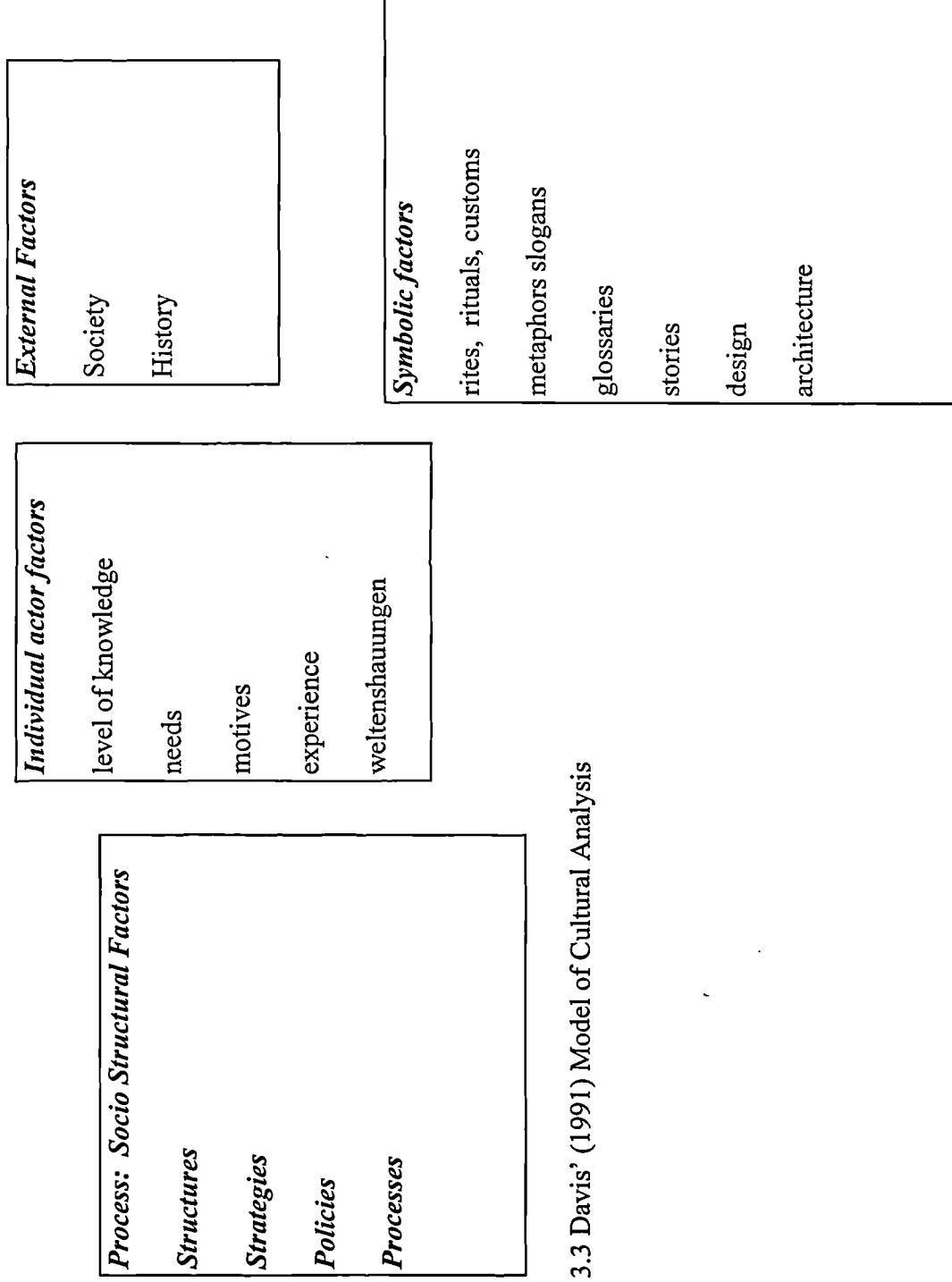
Fig 3.3 Davis' (1991) Model of Cultural Analysis

This model provides clear criteria for investigating and critiquing the implementation of IS from a cultural standpoint which Davis (1991) achieves in a case study of the British Army. Although this proved interesting and facilitated the investigation, the work succumbs to the same criticisms as Peters and Waterman (1992) regarding the reduction of culture to a set of independent variables implying an instrumental treatment, a simplistic and rationalistic bias with a reduction of culture to various categories at various levels.

Avison and Myers (1995) call for a rejection of this narrow definition of culture as "cultures are contested, ever changing and emergent, they are invented and reinvented in social life". Morgan's (1986) conceptualisation of culture views organisations as "culture producing phenomena" as opposed to them "having a culture" which resists by implication any means of instrumental culture "management". Morgan's view of culture is less prescriptive than the view of such as Davis (1991) and Peters and Waterman (1982) and more in line with the critical reflective standpoint suggested by Pettigrew (1985a). For Morgan, culture is viewed as a "metaphor" and metaphor analysis has emerged as a powerful method for organisational analysis. Lakoff and Johnson (1980) point out that in all aspects of life, not just in politics or love we define our reality in terms of metaphors and then proceed to act on the basis of them. We draw inferences, set goals, make commitments and execute plans all on the basis of how we structure our experience, consciously and unconsciously by means of metaphor. Morgan (1986) describes metaphor as often regarded as a device for embellishing discourse, but points out that its significance is much greater than this. The use of metaphor implies a way of thinking and has relevance for understanding organisation and management.

Organisations, Morgan asserts, are complex and paradoxical phenomena that can be understood in many different ways and thus metaphors are a "way of seeing and a way of not seeing", like lenses that reveal particular aspects of an organisational situation but preclude others.

Morgan encourages a conceptualisation of culture which is soft almost spiritual in nature but this does cause a problem with regard to the pragmatic usefulness of the approach for analysing empirical work. However, Avison and Myers (1995) point out that most work on IS culture concentrates on the instrumental treatment and this is an oversimplification. A view of organisational culture as being something an organisation "is" reveals many sophisticated issues which are sometimes not revealed by instrumental treatment. Morgan (1986) provides several examples to illustrate this. One example concerns a manager who attempts to create a coherent organisational culture between disparate warring groups by manipulating symbols and slogans. The manager introduced a wooden cart wheel which was moved between offices symbolising the slogan he introduced, that of "wheeling together". However, the deeply embedded differences were not overcome by this crude instrumental treatment of culture and the situation remained unsatisfactory. Thus, analysis through metaphors encourages researchers to try and perceive the organisation beyond the instrumental treatment of culture. However, the major problem with this approach is that the construct becomes too all encompassing and complex to be useful (Robey and Azevedo 1994).

In arriving at a coherent approach to cultural analysis for this inquiry, accepting Avison and Myers critique, it is recognised by the author that there is a need to identify

distinctive features of culture which can be used as a basis for inquiry and these criteria are supplied by Allaire and Firsirotu (1984) articulated in the IS domain by Davis (1991). The work of Morgan (1986) could be taken as representative literature from the "is" view of culture. As previously discussed the problem with Morgan's approach is that culture becomes a fuzzy notion, difficult to grasp and analyse and in the case of Allaire and Firsirotu (1984), Davis' (1991) case study demonstrates an overly instrumental treatment of culture resulting in systematic treatment.

It was considered important to identify the importance of sub cultures in analysing issues of multiple meanings, differing weltenshauungen and with regard to issues of power. It was also considered important to identify the critical effect of shared meanings in guiding organisational action at both an individual and corporate level accepting that culture can be a powerful unifying force. The "is" view of culture can offer many useful insights to the inquiry drawing on ethnographic techniques as briefly described above.

It was therefore decided to attempt to compromise between the two views of culture. Avoiding Avison and Myers' (1995) accusation of "gross oversimplification" when viewing culture as a set of independent variables, the author decided to attempt to combine the two views. Allaire and Firsirotu's (1984) general categories were utilised in combination with Morgan's (1986) articulation of Smircich's (1983) perception of culture.

Neither approach to understanding culture is cognisant of issues when teams are working across time and space using sophisticated ICT's and in particular involving cross cultural issues. The next section will attempt to address this issue.

3.3.1 Cross Cultural Issues

Avison and Myers (1995) conclude their paper by calling for further conceptual and empirical field research into how new technologies affect or mediate organisational and national cultures. There is considerable interest in the implications of cross cultural issues in the IS area especially as information systems have become global across national and cultural boundaries (Kaye and Little 1996, Robey and Rodriguez Diaz 1989). It is also recognised that some material technology can acquire different meanings in different cultures. The same application of information technology may symbolise deskilling and control in one culture, and upskilling and worker liberation in another (Barley 1986, Zuboff 1988). However, a similar debate to the one outlined in the last section regarding culture and its treatment exists in the related area of international management and cross cultural studies. As companies have attempted to adopt an international strategy in a global marketplace, "how to" style management guides have emerged which attempt to guide executives through the unfamiliarity of everyday life and business practices abroad (e.g. Hall 1995). Most authors who write on the subject of cross cultural management consult the work of Hofstede (1980). The work of Hofstede differentiates between the national cultural characteristics of various countries by identifying the key features of particular cultures and represents them as dimensions. The dimensions used are:

- Power distance which has to do with the extent to which people expect their superiors to think for them, the inequality of power between higher and lower level persons and degree to which that inequality is accepted.

- Uncertainty avoidance has to do with the extent to which the members of a culture feel threatened by uncertain or unknown situations and the extent to which future possibilities are defended against or accepted.

- Individualism has to do with the relative importance of individual goals compared with group goals and degree of interdependency among members of a society.

- Masculinity has to do with extent to which a society values achievement of results, heroism, assertiveness and material success. In a masculine society sympathy is with the winner and fighter, feminine cultures indicate more sympathy with the meek and underdog. Masculine societies are said to "live to work", feminine societies "work to live".

This research has been used by a large number of studies into cross cultural dimensions of organisations (Erez and Earley, 1993, Kedia and Bhagat, 1988) and others studying IS issues (Barret et al 1996, Enns 1994, Hofstede 1997, Segars et al 1994, Straub 1994) and has been shown to be useful. Shore and Venkatachalam (1995) justify their use of this model mainly because it is approachable and clear. However, it has been subject to criticism. Firstly, the work assumes a rationalistic view of understanding cultural differences assuming that "true" characteristics can be derived from a stable, static milieu. Hofstede's research is derived from a scientific methodology using survey techniques and a positivist conception of generalisation and objectivity. The deterministic view of cultural stereotypes emerging from this analysis are unrealistic and conflict with anti positivist accounts of culture from such as Morgan (1986) who

view culture as essentially a social construction and constantly evolving. The defence of this criticism centres on the practical use of the research and value attributed to it in numerous research studies across disciplines.

A second major area of criticism is concerned with the model basis on a single organisation (IBM) and raises the question of generalisability. Erez and Earley (1993) defend the work on the basis that national characteristics dominate corporate or organisational culture. They assert that national culture reflects core values and beliefs of individuals whereas corporate culture can only ever account for relatively peripheral values and beliefs.

The third criticism is concerned with the four dimensions of culture which are not sufficient to study all aspects of cultural difference, for instance strong cultural differences exist within relatively small countries such as the UK meaning that this categorisation can only ever be crude broad brush stereotyping. This is a valid criticism although Hofstede has introduced a further dimension concerning short / long term orientation. This relates to the capacity and level of a particular culture's concern with planning and vision for the future. Shore and Venkatachalam (1995) in their study consider that only two dimensions are necessary to encapsulate the key differences in treatment of the systems lifecycle between national cultures.

The use of the Hofstede model poses difficulties as shown above. In addition the research paradigm used in the Hofstede model is, in the terms of Kuhn (1970), *incommensurable* with the proposed interpretivist approach. In brief, the view put forward by those who subscribe to the paradigm incommensurability thesis argue that

the scientific approach underpinning Hofstede's work rests on assumptions about the nature of truth and knowledge which are incompatible with those of interpretivism. However, much work has been done regarding the usefulness of interparadigm communication. In IS development, the work of Avison and Wood Harper (1990) for instance demonstrates the benefits and pragmatic insights to be gained from incorporating a wide range of strategies for systems analysis. Thus, to ignore the Hofstede study and thereby exclude it from the analysis for reasons of incommensurability would be self defeating as it may lead to insights into particular issues and events and assist in identifying and reinforcing themes. This approach is used in a similar way in the interpretive studies of Barret, Sahay and Drummond (1996). This tentative use of the Hofstede framework will however be supplemented with readings from the literature which deal with Indian characteristics from other standpoints.

To grasp a concept as vastly complex as national culture without succumbing to reductionist, instrumental treatment is potentially overwhelming. One approach identified by the author is to concentrate more carefully on an understanding of the Nation and its structures. Arguably, the only way to achieve that position of understanding is by living and experiencing another culture as suggested by anthropologists involved in ethnographic study (Geertz 1973, Scholte 1972). The author did attempt this and has spent in excess of three months in India between 1996 and 1999 when engaged in fieldwork in Bombay and Bangalore, travel around India on route to a conference and field sites. The author also took several trips in the North of India in the company of an Indian taxi driver, Soshil. Although he spoke very little English he helped the author to understand dimensions of the culture which would have

been difficult to experience if travellling alone due to the language difficulties. In particular the author enjoyed eating at the *dhabas* which are used by the lorry drivers on long routes. The author lived and worked at IIM Bangalore for 7 weeks in July 1998 when teaching a course for MBA students on the ethics of information management. During this period the author took several trips alone by rickshaw, bus and train and engaged in a number of interviews with Indian software companies. These experiences helped the author to reflect on his own position as an Englishman in India and gave insight and experience into the context. In addition to this Sahay and Walsham (1997) propose a framework which describes possible influences that social structure has on the shaping of managerial attitudes in India and how the structures themselves could be influenced. The framework was produced by identifying structural properties of social systems which various authors have identified as shaping Indian managerial attitudes. Drawing and extending on Whittington (1992) the social systems they identify are "national", "communal", "religious", "domestic" and "intellectual". Sahay and Walsham chose these categories following a literature survey on Indian social and managerial attitudes and influences. Table 3.4 is a summarised version of Sahay and Walsham's analysis which was used as a basis for explanation of managerial attitudes to Geographical Information System implementation. This framework is potentially of use in examining the cross cultural dimensions of GSO with especial relevance to the Indian context.

Social Systems	National	Communal	Religious	Domestic	Intellectual
Dominant structures	State	Caste	Community and religious groups	Familial	Professional and academic
Basic Resources	*Socialism and bureaucracy* legitimised by the Hindu world view which lays emphasis on low desire, contentment; independent co existence of state and social groups, membership of castes defining the benefits that can be obtained from the government; distrust of foreign agencies	Social networks divided according to caste and community; the relationship between the different caste groups find sanction in the religious texts and reinforced through social practice	Indian traditional ethos – the Hindu world view and its unifying systems of belief; the importance of rituals in the conduct of daily life; knowledge and status acquired through the interpretation of religious texts; the illusory nature of reality and impermanent nature of existence	Paternal authority; importance of mother son relationship, matrifocal nature of Indian society, importance of tradition, central role of family in shaping social life: family systems extend into work arenas	Supreme status o f the holder of abstract knowledge; emphasis on non rational forms of reasoning; neglect of the documentation of history
Basic rules	Socialistic principles; theme of developing technological self reliance; rules and procedures inherent in government bureaucracies; personal alliances between business men and bureaucrats; paradoxical functioning of the bureaucracy - rigid adherence to rules coupled with personal gratification	Duties ascribed by birth and the rules governing the conduct of different social groups ; functionality in duties; hierarchical relationships between members of different groups; status associated with different group membership; personal rather than contractual relationships preferred; accommodation preferred to confrontation	Rules of conduct about human existence - practical and ethical strategies; cyclical nature of things, dharma and karma; intellect is often subordinated to intuition and dogma to experience	Rules of paternalism: "infantilisation" of the Indian adult; roles ascribed to different family members; caste membership; primal power is feminine; status quo preferred to change; family oriented relationships preferred over professional	Professional codes; emotional and subjective biases; clash of western culture and Indian upbringing; manual work looked down upon; ambivalence toward technology
Organisations	*Central, state and district level offices*	*Neighbourhood communities*	*Neighbourhood communities*	*Households; extended family owned businesses*	Professional bodies and universities

Table 3.4 Social System and the Structural Basis for Management in India (Sahay and Walsham 1997)

By drawing on structuration theory (Giddens 1984), Sahay and Walsham (1997) avoid the criticism of stereotyping and cultural determinism which were earlier criticisms of Hofstede (1980). Structuration theory recognises the importance of structural conditions on agency but does not encourage the view of the "cultural dope" unable to act outside of the structures. Structure for Giddens exists only as "memory traces" in the minds of humans and thus recognises the capability of human action outside of any structural norm. For instance someone could make a decision to haggle with a shopkeeper or offer to barter in exchange for the goods which would not be an accepted norm in the UK. Giddens also recognises the potential of agency to affect structure, for example if enough people haggle or barter then structural conditions can be altered (Jones 1999). The theoretical framework opposes the normative view of culture which tends to assume that culture impacts human action and actors stand outside the social world drawing upon the norms which are 'out there' as a basis for action. The discussion in Sahay and Walsham (1997) provides considerable detail concerning the structural backdrop of the five dimensions and has many references to the literature. This highlights the need to focus on understanding the social practices of people through understanding the variety of social systems which influence them. It is felt that the analysis in Sahay and Walsham (1997) need not be restricted to "managerial" attitudes however. Managerial attitude was the focus of their work but there is no reason why it could not be applied to discuss various levels of analysis in an organisation. The following section will continue the discussion of the reference theory for the theoretical framework and will outline the major theories concerned with power and politics in organisations.

3.4 Power in Organisations

The previous chapter identified that political aspects were likely to be significant in any inquiry into the process of information systems development across time and space. In the author's opinion, the theoretical insights provided by a cultural analysis (subgroups, multiple meanings etc.) would not be sufficient to delve into the deeper political dimensions of an inquiry into the process of information systems development across time and space. It was therefore decided to select an appropriate framework for political analysis.

One of the first contributions to discuss power and politics in information systems development was Kling (1980) and Markus (1983). However, political analysis has never reached the mainstream in IS research partly because power and politics is another "slippery concept". The identification and analysis of power in organisations once again is a difficult concept to tie down with differences of opinion as to its definition and analysis. This has resulted in a proliferation of different definitions being used by writers with little if any agreement between them. There exists a confusion between power and similar terms such as authority, influence and domination (Nagel 1975). Pfeffer (1981) offers a coherent delineation of *power* and *politics* which is helpful in grasping the notion of power:

"if power is a force, a store of potential influence through which events can be affected, politics involves those activities or behaviours through which power is developed and used in organisational settings. Power is a property of a system at rest; politics is the study of power in action" (p 7)

This obsession with definition is considered by some authors to be a "straw man". Hardy (1985) for instance suggests that attention should be directed to asking what power comprises and how it produces results rather than how neatly it can be defined. Narrow definitions thus constrain and restrict the empirical work and therefore following Hardy this research adopted a broad definition which encompasses terms such as coercion, manipulation, authority, domination, persuasion and influences which are various forms of power and politics.

Since Kling's initial work, power issues have been of interest to the IS community for some time. Walsham (1993) uses Morgan's (1986) political metaphor to good effect in analysing several case studies of the effects of implementation of IT. Markus (1983) presents a study of the power and politics involved in the implementation of a management information system. Introna (1996) draws on the work of Foucault (1979) and Clegg (1979) to provide a thoughtful analysis of the power issues surrounding the collapse of the London Ambulance computer aided despatch system. Myers (1997) draws on critical social theory to analyse hidden agendas, power and managerial assumptions in IS development.

The analysis of power can be traced back as far as Hobbes and Machiavelli but contemporary theory is of most value especially where it has been applied to IS . Foucault's ideas and studies are valuable in understanding the nature of power. For Foucault, IT is a technique which achieves its effect through the use of discipline, Bentham's panopticon is the archetypal form of discipline. This concept of the panopticon is extended by Zuboff (1988) in the context of covert and overt surveillance using computer systems.

Giddens (1984) also writes extensively on the subject of power articulated through structuration theory. The concept of the duality of structure is useful in considering whether

an agent is constrained by culture, social group, gender or race or by actions dependant on an individual's will and responsibility. This framework is used by Walsham (1993) to analyse issues of power and control in the implementation of computer systems. Luke's (1974) 3 dimensions of power is elaborated by Hardy (1985) and is a useful typology of work done in the area exposing the assumptions of research streams. The one dimensional approach to the analysis of power is that of the pluralists (e.g. Dahl 1957) whose research focuses on the decision making process and the powerful are those who seek to influence the process. This has been subject to extensive critique as it relies on conflict being expressed and if not then consensus is assumed. The need to broaden power into areas other than decision making has lead to a wider focus. The two dimensional approach develops a second face of power where the use of power is used to suppress issues and prevent them from being articulated (Bachrach and Baratz 1970). The third dimension of power (Lukes 1974) indicates that study of power relations should not be confined to the outcomes of decisions and observable conflict but extended to include suppressed issues. Research into power should thus also consider issues of political *inactivity* and quiescence, ask why grievances are *not* formulated and why demands *not* made and why conflict does *not* arise. Markus and Bjorn Andersen (1987) used this 3 dimensions framework of power to analyse the mechanisms by which IS professionals exercised power over users.

The work of Stewart Clegg (1979) has been influential in the IS field (e.g. Introna 1997) and provides an explanation of what are termed "Circuits" of power falling into 3 categories, the episodic, the circuit of social integration and the circuit of system integration. Although useful it is felt that this framework is designed for a comprehensive political analysis of an organisation and is thus too elaborate for the scope and resources available in the case study.

Some researchers in IS have drawn on critical social theory to identify and analyse political issues (Klein and Hirschheim 1991, Lyytinen 1992, Lyytinen and Klein 1985, Ngwenyama 1991). Although considered useful, this research is focused on a complete political analysis, the author was seeking a less esoteric framework which would supplement and complement a cultural analysis and would be manageable within the resources and timescales.

Pfeffer (1981) differentiates between power and politics. The research is concerned primarily with the decision making process, his political model is shown in table 3.5 below:

Power
    Authority
    Resource acquisition
    Dependency and low substitutability
    Uncertainty absorption

Political tactics
    Selective use of decision criteria
    Selective use of information
    Use of outside experts
    Building coalitions
    Co-optation

Table 3.5 Theoretical Constructs Of Pfeffer's Political Model

This is interesting and is used by Lacity and Hirschheim (1993) to good effect in analysing the decision process with regard to outsourcing. The research requires a model which will be wider in scope than decision making alone. However, the author was seeking criteria to use as a structure for the inquiry. Morgan (1986) indicates two metaphors of organisation associated with power in organisations, the political systems metaphor and organisations as instruments of domination. In the former, Morgan (1986) provides an analytical framework which although more simplistic than the Clegg framework is derived from some of the

theories of power discussed above (Dahl 1957, Lukes 1974). The idea of metaphors of

organisation was discussed in the previous section and is one which the author has sympathy

with. Thus, Morgan's political metaphor was considered appropriate because it offers a

general framework combined from the work of several authors. Also, it is another of

Morgan's "metaphors of organisation" and will be commensurate with the general

organisational analysis approach suggested by Morgan which will be used with the analysis of

culture.

1.Formal authority 2.Control of scarce resources 3.Use of organisational structure, rules and regulations 4.Control of decision processes 5.Control of knowledge and information 6.Control of boundaries 7.Ability to cope with uncertainty 8.Control of technology 9.Interpersonal alliances, networks and control of "informal organisation" 10.Control of counterorganisations 11.Symbolism and management of meaning

Table 3.6 Sources Of Power In Organisations (Morgan 1986)

Morgan (1986) identifies the variables of power (shown above) which is developed as an

analytical framework to understand the power dynamics within an organisation. By way of a

brief resume of the key points of the framework, *formal authority* is identified as the

bureaucratic authority held by an individual or group which is associated with position held

within the organisational hierarchy. The positions are defined as rights and obligations which

create a sphere of influence within which the individual can operate. Formal positions on an

organisation chart are thus spheres of delegated authority to the extent that authority is

translated into power through the assent of those falling under the pattern of command, the

authority structure is also a power structure. Power is not held exclusively at the top however, the impact of trade unionism challenges the power at the top. *Control over the resources* of an organisation (money, materials, personnel and technology) leads to an important source of power. Power rests in the ability to control resources on which the current organisation is dependent for current operations and for creating new initiatives. With regard to *use of organisational structure, rules and regulations,* plans for organisational differentiation and integration, designs for centralisation and decentralisation and the tensions that arise in matrix organisations entail hidden agendas related to the power, autonomy or independence of departments and individuals. The size and status of a group provides an indication of its power within the overall structure since one obvious tactic of control is to down grade the importance of a function. Rules and regulations are also created, invoked and used in a power play. Regulations, decision making criteria plans and schedules, promotion and other rules give potential power to those controlling and those controlled (e.g. working to rule).

With regard to *control of decision process* Morgan (1986) identifies three inter related elements: decision premises, decision processes and decision issues and objectives. Decision premises relates to the control of agendas and other premises which influence how a particular decision would be approached, possibly preventing issues from surfacing at all. In addition to this conscious element, unobtrusive control is built into vocabularies, structures of communication, attitudes, beliefs, rules and procedures that exert an influence on decision outcomes. These assumptions act as mental straitjackets which prevent problems and issues being fully formulated and alternative courses of action. The constraints include beliefs and practices and "the way we do things around here".

Control of process is more visible than premises. How should decisions be made, who should be involved, when will the decision be taken etc. all act as ground rules to manipulate and stack the deck in favour of a particular decision. The issues and objectives and evaluation criteria are the final ways of controlling decision making. An individual can shape issues and objectives to be discussed by preparing the reports and contributing to discussion on which the decision will be based.

Central to the idea of power is *knowledge and information* and the ability of persons to structure attention to issues in a way that in effect defines the reality of the decision making process. The concept of the gatekeeper is fundamental in that hierarchy and structural division influences how information flows. Gatekeepers can control the pace and spread of information at key times. Organisation structure also effects access to key information and lines of communication and information systems contain assumptions which are of crucial importance in structuring day to day activity. Technology is often used to bring control to the centre while increasing surveillance at the periphery. Knowledge and information can be used to increase personal power by having exclusive access to key data thereby enhance one's indispensability as an expert. *Control of boundaries* is concerned with the boundary between different work groups or between an organisation and its environment. Those who control boundary transactions can wield considerable power by monitoring changes occurring outside one's own group and critical interdependencies or information which enhance personal power. Boundary management can integrate a unit or isolate it for greater autonomy. Many groups or departments are successful in acquiring considerable degrees of autonomy which make the organisation operate as a loosely coupled group rather than an integrated unit.

Control of Uncertainty is divided into two types: environmental uncertainty and operational uncertainty. Environmental issues concern such issues as raw materials or finance and can be a source of power to those with contacts or skills to tackle problems. Operational uncertainty can help trouble-shooters and maintenance staff to acquire power and status as a result of their skills and actions.

Organisations attempt to reduce uncertainty by buffering or through processes of routinisation but inevitably uncertainties exist and the means by which the organisation deals with this are critical to power relations. Issues of *control of technology* be it an artefact (computer system) or mode of organisation (e.g. move to structured IS development methods), the technology influences patterns of interdependence between individuals. The introduction of new production methods, machines or any kind of technological change will increase the power of one group at the expense of others. The technology is manipulated and controlled in the same way as rule and regulations.

Interpersonal alliances networks and control of the informal organisation is concerned with the networks of people, sponsors etc. providing a source of power to those involved. Organisational politicians thus create informal alliances and networks within the domain of operation. These networks are often invisible to the formal organisation and consist of informal meetings, the old boy network etc. They are sometimes formalised into meetings of professional associations, joint ventures, project groups etc. The importance of the informal organisation cannot be overstated and influential members of groups who for instance meet together informally for lunch or drinks are often as powerful as managers.

Counter organisations emerge when a small group of people hold a considerable amount of power and opposing forces co-ordinate their actions to create a rival power bloc. Unions are a good example of this but other regulatory bodies keep control of monopoly power for instance. The strategy of countervailing power thus provides a way of influencing organisations where one is not part of the established power structure.

Symbolism and management of meaning is related to culture analysis although here Morgan's work adopts a rationalistic view of culture (organisation *has* a culture) and as argued earlier the author does not fully agree with this perspective. In common with Morgan, Peters and Waterman (1982) and Davis (1991) would argue that language, symbols, stories, ceremonies, rituals and all other attributes of corporate culture and can be used to "manage meaning" and hence shape power relations. Therefore, managers aware of this give attention to the impact of their words and actions and how theatre, physical setting appearance and style add to their personal power. For instance, the rules of dress are quickly apparent in most organisations and style such as arriving slightly late for a meeting when one's knowledge is critical.

The next section will discuss the critical element missing from these considerations of culture and power, that of the impact of globalisation and in particular the effects of time and space.

3.5 Globalisation Tendencies

The theoretical framework so far is complex enough. However it was considered necessary to engage directly with the consequences of globalisation in order to analyse the additional dimensions of time and space on the process of information systems development. Chapter one discussed some of the themes of globalisation concentrating on a critique of the

convergence view of globalisation that suggests that IS development across time and space is only limited by the capacity of technology to connect teams together. This section will continue this critique and analyse some key debates regarding globalisation and introduce a framework for the research inquiry derived from the work of Anthony Giddens (1990,1991).

Yeung (1998) refers to the "ultraglobalist" Ohmae's (1994) presentation of the argument that under current conditions of globalisation the world has become "borderless". For Yeung, Ohmae's claims that we have entered a world in which investment, industry, information flow and individuals move relatively unimpeded across national borders are unrealistic. According to Ohmae, the "borderless world" has several distinctive tendencies:

1) Investment is no longer geographically constrained so that capital can flow to places that generate the highest return or best opportunity.

2) Industry is much more global in orientation. The state has lost control over the whereabouts of capital.

3) Revolutions in information and transportation technologies have enabled global corporations to operate virtually everywhere in the world.

4) Consumers are becoming global in their tastes.

The view expressed by these tendencies is seductive in its simplicity but has some credibility. For instance, Castells (1996) points out that new information and communication technologies have enabled capital to be managed around the clock in globally integrated financial markets working in real time. It cannot be denied that the pace and intensity of interconnection have increased and Harvey's (1989) conception of "time-space compression" is demonstrated in areas such as software and remote diagnostics. Also, although labour

markets are not truly global, firms can choose to locate in a variety of places worldwide to find the labour supply they need. However, Ohmae's writings give the feeling that the "invisible hand of globalisation is out there" like a genie let out of a bottle and individuals, corporations and nation states are powerless and need to react to globalisation in order to survive.

Castells (1996) and Yeung (1998) point out the deficiencies in Ohmae's version of globalisation. They point out that markets are still far away from being integrated; capital flows are restricted by currency and banking regulations, the mobility of labour is undermined by immigration controls and people's xenophobia and multinational corporations still keep most of their assets and their strategic command centres in their historically controlled "home" nations. The globalisation thesis expressed by Ohmae ignores the persistence of the nation state and the crucial role of government in influencing the structure and dynamics of the new economy. On this issue of the role of government, Yeung (1998) points out that the most important driver of globalisation is the spread of economic liberalisation. For instance, since the early 1990s, Indian policy regarding the liberalisation of the software industry enabled the creation of current market conditions. Previous Indian government in a different protectionist frame of mind had ejected the same companies who are now setting up large scale operations. Rangan (1999) points out that a global change from state socialism to market capitalisation has unleashed internal deregulation and liberalisation from France to the former Soviet Union. Rangan's view is that a period of war or sustained high unemployment may cause governments to act in ways that would reverse globalising trends.

By concentrating on global forces, the ultraglobalist argument leads to a view that for a foreign software company setting up in Bangalore, the only culture that matters is the corporate culture and place is de-emphasised. This de-emphasises the persistence and importance of the local context or place opening another key globalisation debate, that of the importance of global and local issues.

Massey (1995) points out that in the context of cities, places have become more open than they have been in the past and that the complexity of interconnections which link places together has increased dramatically. Massey cites Castells (1989 p.349) who takes the position that 'social meaning evaporates from places and therefore from society and becomes diluted and diffused in the reconstructed logic of a space of flows...'. Giddens (1990) discusses how 'modernity increasingly tears space away from place by fostering relations with absent others, locationally distant from any given situation of face to face interaction'. Although in conditions of 'modernity' there is penetration by global firms and products, and relations with 'absent others', the local is not necessarily destroyed by the global. Rangan (1999) points out that global firm corporate relationships are still strongly related to place. Customers, national and local governments, rivals, shareholders, financial institutions and the local community all tend to be influenced by local contexts:

"From language to labour policy, punctuality to property rights, taxation to transfer pricing, accounting rules to supplier relationships business still operates differently across nations and regions" (Rangan 1999).

Under conditions of compression of time and space, even software firms find the importance of place to be significant:

"…..as every executive knows, reliable information is the lifeblood of economic decisions. And even in this day and age, reliable information is acquired more readily and more reliably locally than from afar" (Rangan 1999).

The clustering together of software firms in centres around India is evidence of this. Within the cities, there is evidence of the favouring of close proximity, Bangalore's "electronic city" is an example.

Dealing with the point of space being torn from place, Giddens's and Castells's point is that in our present period, spatial movement, interaction, influence and communication have become so extended, so fast and available that the notion of place needs to be re thought (Massey 1995). Giddens's meaning of space seems more akin to a conception of 'distance', that the boundaries of 'place' are torn away. Massey (1995) takes the view of place as having potentially stronger personal ties and psychological connections, for instance place representing "a home" and space "a house".

Massey (1995) points out that although the latter day connections are much more intense, there is nothing new in the interconnections between places. Countries which have been colonised such as India by the British have experienced the effects of globalisation via foreign invasion, goods etc and yet the country has not "converged" or identities transformed in the ultraglobalist sense and the notion of place remains significant.

Theorists such as Massey (1995) argue for a more complex understanding of the global and local and the significance of place than that presented by the ultraglobalists. The interconnectedness of places and time space compression cannot ignore the boundaries

between places which are socially constructed and yet have effects both involving laws and regulations and through nationalistic tendencies. Secondly, linkages between places mean that their fortunes are interconnected and interdependent but that the interdependencies are unequal. Power relations regarding the influence of multinational companies and the global media are significant as are the notions of an international division of labour. For instance a few major multinational companies control the media and there are military and political inequalities between nation states. The international division of labour refers to the way in which different areas of the world play different roles in a wider system. With regard to India, the author's experiences seem to indicate that increasingly UK and US cultural influences are part of the Indian mindset, people in UK and US may attend an exhibition to learn about Indian culture, Indians don't need an exhibition to learn about UK or US culture as it forms part of their everyday frame of reference. Thus it seems desirable that cultures do not put up barriers to protecting their distinctiveness but the alternative of endless mixing is on unequal terms (Massey 1995). Remaining with the pertinent example of India, the number of 'connections' a particular place has may not impact positively on other less connected places. Castells (1996 p113) points out that the policy of liberalisation induced an economic boom around such areas as Ahmedabad, Bombay, Bangalore and New Delhi but quasi economic stagnation continues in most rural areas as well as some major metropolitan areas such as Calcutta. Social inequality and a new brand of unrestrained capitalism keep the majority of the Indian population, including in the most dynamic urban centres, in miserable living conditions.

Over the last few years there has been an increasing interest in the work of the sociologist Anthony Giddens. Giddens's work on structuration theory has been found to be useful by many authors in the field of IS (Orlikowski 1992b, Robey and Azevedo 1992, Walsham

1993). In his later work Giddens (1990, 1991) has written extensively on the subject of social life in what he terms "high modernity" and this has recently also been of interest to IS researchers (Walsham 1998).

The author was searching for theories that would help to understand the impact of globalisation at a high level of abstraction. It was hoped that this theory would provide a *vocabulary* for discussing the impact of globalisation with particular regard to the cultural and political analyses but also as a means to generating themes and lines of inquiry. Giddens's writings appeared to offer what was required.

Giddens identifies three key areas that characterise the current period in which we are now living, the consequences of what Giddens terms high modernity. These three areas are *separation of time and space*: the condition for the articulation of social relations across wide spans of time space up to and including global systems. *Disembedding mechanisms* consist of symbolic tokens and expert systems; disembedding mechanisms separate interaction from the particularities of locales. *Institutional reflexivity* concerns the regularised use of knowledge about circumstances in social life as a constitutive element in its organisations and transformation (Giddens 1991). The first two areas are of most relevance to this study and are discussed in some depth in the following discussion.

3.5.1 Separation Of Time And Space

Giddens describes the separation of time and space to be important characteristics of the modern, global world. In pre-modern settings, time and space were connected through the situatedness of place, where the ordinary day-to-day activities took place. Markers were

connected not just to the "where" of social conduct, but to the substance of conduct itself. The development of the clock contributed to the separation of time from space, and in the creation of an "empty" dimension of time. Everyone now follows the same dating system: the approach of the "year 2000," for example, is a global event. The separation of space from place is another feature of modernity. In pre-modern societies, space and place largely coincide, since social life was still dominated by conditions of "presence." Modernity brings about interactions between "absent" others, and thus separating space from place. This separation provides the basis for their recombination in ways that co-ordinate social activity without necessary reference to the particularities of the place. Modern social organisation presumes the precise co-ordination of the actions of many human beings physically absent from each other; the "when" of these actions is directly connected to the "where", but not, as in pre-modern times, via the mediation of place. This phenomenon of the separation of time from space helps to drive modern social life away from the hold of tradition. Information technology plays a crucial role in this separation of time and space. Although Giddens does not refer to information technology in his writings, the importance of networks is implicit in his discussions concerning globalisation. Information technology enables interaction between people across a variety of time-space boundaries. Computer memory helps to preserve information about people, organisations and events across time and space limitations. Also, computer systems often have implicit assumptions of time-space and their control embedded within them.

3.5.2 Disembedding Mechanisms

The disembedding of social institutions refers to the process of the "lifting out" of social relations from the local contexts and their redefinition across indefinite domains of time-space. Giddens describes two types of disembedding mechanisms: "symbolic tokens" and "expert

systems." Symbolic tokens, for example money, are media of exchange which have standard value, and are thus interchangeable across a variety of time-space contexts. Money economy becomes more sophisticated and abstract because money brackets time (because it is a means of credit) and space (since standardised value allow transactions between individuals who physically never meet one another). When Giddens refers to expert systems he is not referring to complex computer systems but to systems of knowledge which bracket time and space through deploying modes of technical knowledge which have validity independent of the practitioners and clients who make use of them. Expert systems penetrate virtually all aspects of social life and self - in respect to the food and medicines we eat, the buildings we inhabit, and the forms of transportation we use. Expert systems are not confined to areas of technological expertise, but the doctor, the counsellor, and the therapist are as central to the expert system of modernity, as the engineer, technician or scientist.

As well as the three major themes, Giddens identifies other key aspects of modernity, trust and self identity.

3.5.3 Trust

The notions of trust and risk are of central concern to us in the modern world that is characterised by circumstances of uncertainty and multiple choice. Both trust and risk are centrally connected with whether positive inferences from our past experiences can in some way be dependable for the present. Trust is an important element of our individual personality, and it also influences how one interacts with external systems. It shapes how we deal with everyday reality. Trust is intimately connected with the notion of time-space, and its absence. We have no need to trust someone who always is in view, whose thought processes were transparent, and

whose activities, can be constantly monitored. Because of the intimate connection between IT and the restructuring of time-space, IT helps to redefine the notion of trust in the modern world. There is also a need for trust in expert systems often with little understanding of the knowledge that underpins them.

3.5.4 Self Identity

Giddens (1991) makes significant points about the nature of identity in high modernity. The level of time-space distanciation introduced by high modernity is so extensive that for the first time in human history self and society are inter related in a global milieu. Giddens discusses this process as changing the nature of trust and risk and an increase in reflexivity. In the context of a post traditional order, the self becomes a reflexive project, the altered self has to be explored and constructed as part of a reflexive process of connecting personal and social change. Giddens gives the analogy of the new sense of self that a individual has to cultivate after marital separation, but this reflexive mobilising of self identity is not confined to life's crises but a general feature of modern social activity in relation to psychic organisation.

Robertson (1992) critiques Giddens (1990) pointing out that Giddens calls for an 'institutional' analysis as opposed to cultural or epistemological matters. According to Robertson, Giddens's focus on the institutional means that he largely neglects analysis of interstate and transnational relations as well as international law and intercultural relations. Giddens's attempt to diminish cultural considerations is according to Robertson, 'a great weakness':

'While he may claim that globalisation does not involve the crushing of non-western cultures he does not seem to realise that such a statement requires him to theorise the issue of 'other cultures''(p.142).

Thus, for the purpose of this inquiry, additional writings dealing with cultural dimensions of globalisation have been consulted (discussed in chapter one) and cultural and cross cultural frameworks integrated into theoretical framework.

Robertson (1992) challenges Giddens view that globalisation is "consequence of modernity" which is "out there" causing globalisation. Robertson's view of globalisation, or the preferred term glocalisation, is not so much a consequence as a condition of modernisation. Robertson's central themes refer to both an increase in global interdependence and the awareness of the interdependence addressing the issue of consciousness:

'Globalisation refers both to the compression of the world and to the intensification of the consciousness of the world as a whole" (1992 p8).

Robertson suggests, contrary to many commentators, that this compression has been going on for longer than merely the last century although in differing forms. Robertson's central area of concern is with the problem of consciousness and culture and this is where his work departs from that of Giddens. For Robertson, the character of globalisation resides in the consciousness of the global situation in which we all participate. His central discussion concentrates on the interplay of particularism and universalism.

Robertson's (1992) categorises the globalisation debate into those writers who are 'homogenisers' and those who are 'heterogenizers'. Clearly the distinction is not clear cut but ultraglobalists such as Ohmae (1994) are obvious homogenizers who subscribe to the idea of a 'world system'. Robertson also sees Giddens (1990, 1991) work as being in the former category because of the search for and analysis of the universal in the particular. For instance, Robertson points out Giddens's attempts to demonstrate the universal in the particular regarding the discussion of aspects of time-space distanciation. This according to Robertson, implicitly invokes a scenario of convergent development, that localities are somehow globalised. Robertson categorises such writers as Hall (1991) as heterogenizers who on the other hand tend to dispute that any world system exists and dispute convergence. He divides the intellectual disciplines which these writings emerge from as social science and cultural studies respectively.

Robertson attempts to transcend this convergence - divergence debate with his concept of 'glocalisation', meaning that universalism is the condition of growing particularizations. Thus the existence of the 'global' is to some extent illusory as is the tendency to cast globalisation in tension with the idea of localisation. Thus, Robertson disputes the view of globalisation as a consequence of modernity which is a force both of which are "out there" in a very real sense. Robertson presents a perspective on globalisation which in its broadest sense concerns the compression of the world but involves the creation and incorporation of locality, 'glocality' represents a global creation of locality.

Beck (1992) complements Giddens's analysis of risk and provides an analysis of the "risk society" concerned with the changing nature of society's relation to production and distribution relating to environmental impact as a totalising, globalising economy based on

scientific and technical knowledge. Beck develops an overview of key elements of current social development: the centrality of the political economy of knowledge, the changing roles of class and gender in a new work environment and politics of the risk society. Becks's analysis complements the debate on the negative implications of globalisation by drawing attention to the risk of globalised pollution (via atomic accident or the addition of toxins to foodstuff for instance) which may affect many generations and often these hazards are often imperceptible. The discussion on new international inequalities for instance is of concern. A consequence of globalisation tendencies to move production to the cheapest centre is demonstrated at the chemical accident at Bhopal, India which led to thousands of deaths when the plant exploded releasing toxic chemicals into the atmosphere. Beck argues this shows a "systematic attraction between extreme poverty and extreme risk" where "material misery and blindness to hazards coincide". This reinforces the point made earlier about the inequality of globalisation effects but also demonstrates a "boomerang effect" as the pollution from such industries cross national boundaries and foodstuffs grown using dangerous pesticides enter into the foodchain of developed countries benefiting from the cheaper production in third world countries.

Notwithstanding Robertson's critique, Giddens's theories have had had some influence in IS, Jones (1999) argues that Giddens's later writings (1990, 1991) 'deserve serious consideration in the IS literature'. Walsham (1998) uses these analyses to good effect in considering cases of professional identity across several cases where work has been for example deskilled. His paper explores the linkages between the use of information technology and changes in self identity of professional groups in terms of how they see and describe themselves in relation to their work and that of others. The paper also argues that the results of the case study when analysed using Giddens's (1991) macro level social theory can offer help in generalising

micro level studies and that micro level studies can add an IT dimension to macro level theories.

In essence the inclusion of Giddens's work will provide a vocabulary, an analytical apparatus and will help enable a fuller exposition of power and culture issues across national boundaries. Moreover, Giddens's writings will assist in understanding the cultural and political issues within the broader context of globalisation. In this way, reflection on this case in relation to wider societal features and movements identified by Giddens will enable deeper examination and possibly contribute to the validity and generalisability of the case study.

3.6 Initial Theoretical Basis

This section will briefly summarise the justification for the inclusion of the various theoretical strands in the theoretical framework.

3.6.1 Culture And Cross Culture

Schein (1985) points out that culture at the organisational or national level provides an interpretive context that enables members of a culture to make sense out of their surroundings. Behaviour is guided by culture and because it is acquired through early socialisation, people are often not completely aware of the effect of culture on their actions. Often this awareness of the cultural context is heightened when a person moves outside of their own culture and is then confronted by different assumptions (Robey and Rodriguez Diaz, 1989 p231). Globalisation processes such as those related to GSOs, help to bring alternative cultural contexts to interact with each other, highlighting the need for research on the impact of

national and cross cultural issues on IS development and implementation. This need has been recognised as vital for multinational firms by a number of IS researchers, for example, Harrison and Farn (1990) and Kumar and Bjorn Andersen (1990).

Different authors have discussed various elements of national culture and their influence on the processes of information systems development and use. King and Sethi (1993) report that global firms run different IS-operations between countries and the integration of these culturally diverse systems "require substantial understanding of local business practices and people". Ein Dor et al (1992) have developed a list of national cultural variables that affect information systems. Shore and Venkatachalam (1995) also discuss the influence of national cultural factors on the approaches to parts of the systems development lifecycle. Similarly, Hunter and Beck (1996) identify differing skills of analysts in different national cultures. These different studies, in varying ways, emphasise the point that when the process of information systems development involves development staff from different nationalities, we need to take issues of national and organisational culture seriously into the research framework. In the words of Gupta and Raval (1999) cultural issues can "make or break an offshore project".

3.6.2 Power And Politics

Another key theoretical area concerns the impact of power on IS development and implementation. Power is conceived by Hardy (1985) as the ability to affect the behaviour of others in a conscious and deliberate way encompassing concepts of coercion, manipulation, authority, persuasion and influence. While the implication of power in IS has been under research for some time (for example, Markus 1983), little or no research on GSOs or

information systems development across time and space has explicitly addressed the issue of power. There are studies that have addressed the issue of power and IT outsourcing within a national context (e.g. Kern & Silva 1998, Lacity and Hirschheim 1993), but these issues remain largely unexplored in more global contexts. In this study, the author has attempted to explore cultural and power issues in conjunction in order to examine the impact of culture and cross-cultural issues on power relations.

3.6.3 Globalisation

Since the very purpose of GSO is to enable distributed software development, issues of time and space cannot be ignored even at the risk of adding to the complexity of a myriad of already very sophisticated set of issues concerning culture and power. The final part of the framework for analysis thus concerns time and space and draws upon the influential later writings of Anthony Giddens (1990, 1991). Although not writing explicitly about information technology issues, Giddens writes extensively on the subject of time - space and globalisation. He identifies some key features of contemporary life that, in his view, distinguish it from life that has gone before. For example, with respect to time and space, Giddens writes that in present times of modernity, social structures are based more in conditions of absence as compared to a previous basis of face to face presence. The inclusion of explicit consideration of issues of time and space and the other key factors Giddens identifies will also help enable a fuller exposition of power and culture issues across national boundaries.

These different theoretical "lenses" drawn upon for the study are summarised in the table below.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│    Political analysis                        Culture and cross culture│
│                                                                       │
│                                                                       │
│         Macro theory concerned with globalising tendencies            │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```
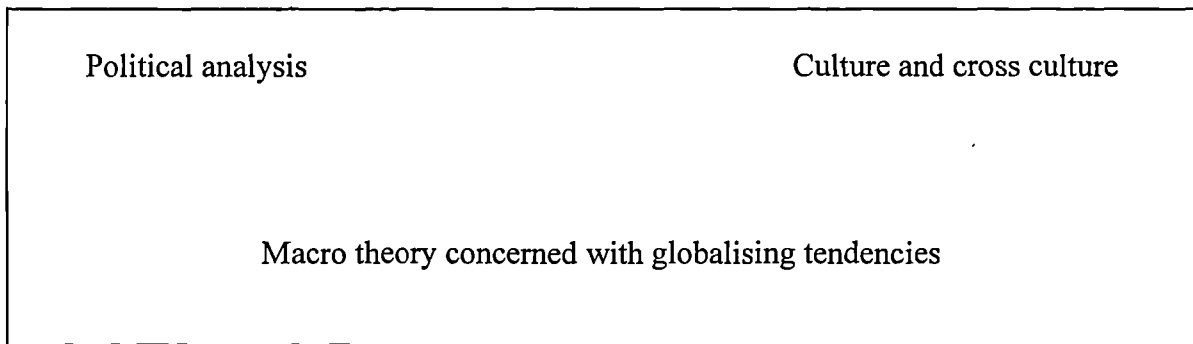
Fig 3.7 Initial Framework for Analysis

The theoretical framework described could be criticised as being unwieldy and exhaustive. However, it is not the intention of the author to go through each stage in a prescriptive, instrumental manner. As discussed earlier, it will be used in the spirit of contingency (see for example Avison and Wood Harper 1990) and it is possible that other theories or approaches could be utilised in later stages of the research when the investigator has become fully involved in the data collection. Pettigrew (1985a) points out that a researcher should come to the situation with a range of theories to analyse particular phenomena which are manifested in the process under study. This is the philosophy of the approach. An iterative process of experience, reflection and learning will enhance the research process.

3.7 Summary

It is worth revisiting the initial research question discussed in chapter one:

What are the cultural and political issues involved in the process of information systems development across time and space?

How are these issues affecting the process of information systems development across time and space?

This chapter has described the major reference theories to be used in forming a theoretical framework to inform the study and go some way to answering these questions. It has become apparent from the literature search that the important organisational and management issues involved in the study of GSO are associated with power and politics, culture and cross culture and the impact of globalisation. Literature around the area of power and culture was reviewed as well as Giddens's writings on globalisation. Reflecting on this and the literature search in chapter two provided guidance for an initial framework for analysis which comprises of reference theories of politics and power, culture and cross culture and consideration of globalisation tendencies.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

Chapter three has explicated the major theoretical grounding to the research. This chapter will examine the underpinnings of the research approach examining the philosophy, research tradition and techniques which will guide the investigation. The discussion is divided into sections covering a critique of research tradition and methodology in IS. This is followed by a justification for the research design. The final section describes the research method and procedures which were adopted in the research inquiry.

It was felt by the author after the literature review, initial interviews and discussion with colleagues that an analysis of sophisticated political and cultural issues required an holistic, in depth examination of the process of information systems development across time and space. It was felt to be necessary to capture the views of the various stakeholders and their multiple perspectives on events and issues over a longitudinal period. This would allow the development of trust and to witness the evolution of events and issues. Empirical studies which collect data of the nature described above are broadly classified as "interpretive case studies" (Walsham 1995) and there is an increasing body of work in the IS literature based on this approach (for example Markus, 1983; Suchman 1987, Zuboff 1988; Boland and Day 1989; Orlikowski 1992a; Walsham 1993, Walsham and Sahay 1999). This approach combined with contextualism (Pettigrew 1985a, 1987, 1990) over time has formed the basis

of the research methodology for the inquiry and the sections to follow will discuss and justify this decision.

4.2 Research Paradigms in IS

The work of Zuboff (1988) has been a major influence on the decisions regarding research methodology. A good starting position is offered when examining issues of research philosophy:

"Researchers must have a theory of reality and of how that reality might surrender itself to the knowledge seeking efforts. These epistemological fundamentals are subject to debate but not to ultimate proof. Each epistemology implies a set of methods uniquely suited to it and these methods will render the qualities of data that reflect a researcher's assessment of what is vital" (Zuboff 1988).

The information systems research community generally accepts the existence of two discrete major research paradigms. Galliers has classified research methodologies into the categories of "scientific" and "interpretivist" (Galliers 1985, Galliers 1991). Although this may be useful as a general guide, it represents an oversimplification. Klein and Myers (1999) identify a third paradigm drawing on critical social theory. They also identify that interpretivist research can be based on hermeneutics, postmodernism or deconstruction. Archer (1988) also provides more sophisticated delineation and identifies "positivism" of the scientific paradigm, "non positivism" in which facts and values are inseparable and "normativism" in which scientific knowledge is seen as ideological. Archer also distinguishes between the "external realism" adopted by positivism, "internal realism" (the inter subjective construction

of reality) and "subjective idealism" (each of us constructs our own reality). With regard to specific methodologies, frameworks such as Galliers' lead to a pigeonholing of qualitative and quantitative methods. This leads to misconceptions for instance that interpretivist research can only be undertaken by the use of qualitative techniques. Kaplan and Duchon (1988) have used statistical analyses within interpretivist studies and Klein and Myers (1999) point out that qualitative research can be done in a positivist, interpretive or critical sense. So, by extension case study research can be positivist (Yin 1989), interpretive (Walsham 1993) or critical, just as action research can be positivist (Clark 1972) interpretive (Elden and Chisholm 1993) or critical (Carr and Kemmis 1986). It could be argued that Galliers' attempts to categorise and "pigeonhole" has lead to approaches which attempt to rationalise the process of selection of methodologies and techniques. Mingers (1996) for example broadens the categorisation into a "multimethodology" frame to enable the selection of multiple methods for a given research problem. The author resists this approach fundamentally for two main reasons. Firstly, rarely or if ever would an academic be faced with a research site or problem without any idea of which approach or methodology to take. A rationalistic approach to research methodology choice ignores the need to consider the background and preferences of the researcher. At a simple level, positivism and interpretivism imply particular world views which are intensely personal and can go so far as to reflect one's personal attitude to viewing events in one's life. Rationalistic approaches to "selection" presume that an interpretivist researcher engaging in longitudinal ethnography one day would engage in laboratory experiments the next. This is clearly unfeasible.

With regard to methodology selection, the author has empathy with the work of Jayaratna (1994) although his work refers to IS development methodology, his description of an ongoing dialectic between the researcher, the problem situation, the framework of ideas and

the methodology is appealing. Jayaratna's view of methodology critique and selection is that it is far from a rational process and reflects Schon's (1983) "swampland" of practice and the ongoing struggle to make sense of a research process or intervention. The most interesting recognition of Jayaratna's approach is that the researcher has a "mental construct" which influences interpretation of methodology and has preferences and prejudices. The author's own choice of methodology emerged from being personally "comfortable" with a particular research tradition in IS, the influence of like minded people and subsequently seeking out suitable organisations for empirical work.

When all that is said, it is necessary to consider the main differences in the major paradigms of practice. Positivism and interpretivism are recognised as paradigms of research theory and practice and the discussion will concentrate on contrasting these. Critical social theory has some acceptance as a paradigm of practice within the IS research community and is worthy of commentary. Klein and Myers (1999) point out that IS research can be classed as critical if the main task can be seen as one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Critical research seeks to be emancipatory in that it aims to help eliminate the causes of unwarranted alienation and domination. Critical theorists assume that people can consciously act to change their social and economic conditions which are constrained by various forms of social, cultural and political domination as well as natural laws and resource limitations. Examples of a limited number of studies undertaken using the critical paradigm include Myers and Young (1997) based on ethnography, Ngwenyama and Lee (1997) who provide a theoretical study using the results of a previous study on email and Forester (1992) who once again uses ethnography. In the author's opinion, to regard critical social theory as a paradigm of inquiry is problematic. Firstly, Wilson (1997) presents a critique of the emancipatory aspirations of those who would

research and practice IS within this paradigm and questions whether any intervention or inquiry can be truly emancipatory. Secondly, critical social theory does not clearly express the characteristics of a paradigm as shown in table 4.1. Few guidelines to practice exist leaving it a vague and woolly concept to follow in real world research. Thirdly, the author examined the instances where critical social theory has been utilised in IS research inquiry, for instance in the ethnographic study by Myers and Young (1997). When considering this study it is difficult to grasp how the results of the declared critical ethnographic study would differ from an interpretivist ethnography with critical social theory as part of the theoretical framework. In conclusion, the author posits that critical social theory can be used as a means to interpreting research findings as part of a theoretical framework but as a paradigm of inquiry it is incomplete. Therefore, the discussion will continue considering the positivist and interpretivist paradigm.

Walsham (1995) asserts that the differences between the scientific and interpretivist approaches are addressed formally by considering their epistemological and ontological stances. The differences between the approaches are significant , not trivial and nor are they bridgeable. They relate to what we think or can say about what the world is, to how we can express or represent this knowledge; to the nature of man himself and consequently to how we can properly investigate the world. The differences relate to opposing sets of beliefs on the causes and nature of things and of the principles governing existence, perceptions, human behaviour and the material universe (Flood and Carson 1992 p272). Table 4.1 below summarises the approaches.

scientific		interpretivist
realism	ontology	nominalism
positivism	epistemology	anti positivism
nomethetic	methodology	ideographic
deterministic	human nature	voluntaristic

Table 4.1 Key Differences Between Interpretivist And Positivist Position

4.2.1 Positivism: The Scientific Paradigm

Without embarking on an historical treatise, the success of the positivist project can be linked to that of the Enlightenment project. The achievements of positivism and the scientific method are significant, the obvious examples exist in natural sciences such as Biochemistry and Physics leading to the eradication of major diseases and an enhanced understanding of the Universe. Thus, the philosophical issues and dominance of positivism extend from the historical development of Western society from the Enlightenment and the dominant scientific approach that has been successful in advancing human knowledge particularly in the natural sciences. Positivism assumes that facts and values are distinct and scientific knowledge consists only of facts. Reality exists independently of our construction of it (Archer 1988). As previously stated, positivism is linked strongly to the scientific method which has four main characteristics: hypothesis testing, reductionism, repeatability, and refutation (Flood and Carson 1992).

Positivism and the scientific method have much in common with "hard" systems analysis which has dominated IS development since the 1950s. Checkland's (1981) account of this is interesting as it addresses the weaknesses of positivism in the analysis of society through the failures of systems analysis. The evolution of positivist research methodology like hard systems analysis has involved serious attempts to extend the methods of the natural sciences into complex social domains. An interesting case which demonstrates the limitations of scientific approaches concerns the practice by American RAND Institute systems analysis for planning problems in the USA during the 1950's and 1960's. The methods used were quantitative and were based on rational assumptions about the nature of society. These reductionist methods were seen to be inadequate for the complexity of irreducible human systems. Checkland (1981) tells the story elegantly of the inadequacies of the method for dealing with "soft" "fuzzy" or "ill defined" problems. The same message of the inadequacies of the technical rationalist paradigm is presented in Ackoff (1979) and Ritell and Webber (1974) who expound on the limitations of traditional operational research and nature of "wicked" problems respectively. The mistaken assumption of a rational, deterministic society, coupled with problems that would not succumb to reductionist treatment has led to "soft" approaches which claim greater insight into soft, human or fuzzy problems. The same assumptions exist within scientific research methodology and thus the same criticisms can be levelled. Glaser and Strauss' (1967) influential argument for theory building through qualitative research rather than hypothesis testing provide an alternative to progress via statistical or experimental hypothesis testing. The reliance on experimental or statistical control as the defining feature of scientific research stems from a desire for objective

measurement, free of experimenter bias. Churchman (1979) has strongly attacked this approach:

"(it is) silly and empty (to) claim that an observation is objective if it resides in the brain of an unbiased observer (instead) one should say an observation is objective if it is the creation of many different points of view".

2 Scientific Research Methods in IS

As previously stated, attaching research methodology to paradigm is problematic. However, some methodologies naturally lend themselves to scientific inquiry exclusively and scientific methods of research still make up the dominant tradition in IS. Laboratory experiments represent the method which encapsulate the full range of positivist world view. In a laboratory experiment, quantitative techniques are used in a controlled laboratory environment where relationships and variables can be controlled. The aim of the method is to use scientific methods which produce results which can be generalised to the real world. The major strength of this approach lies in that a small number of variables can be studied intensely, the major weakness lies in the validity of the control of the variables and the extent to which the findings are generalisable from an artificial setting. Other scientific approaches include field experiments which extend the laboratory approach into real world with similar benefits. However, they are often criticised as they over simplify the real world, can isolate variables found and access is problematic. Scientific approaches to survey methods allow a large number of variables to be studied in snapshots of practice via questionnaires and / or interviews. Popular ways of handling this are by using the telephone or the internet with a questionnaire on a web site or via email. Large sample sizes provide credibility for

generalisation and they do describe real world situations. However, the depth of information gained using these techniques is low and it is often difficult to study contentious issues which require trust which can only be gained in a long term relationship. Importantly they provide little insight regarding causes or processes behind phenomena studied and it is difficult to eradicate bias in responses and moment in time that the research is undertaken. Response rates tend to be low (Galliers 1991). Case studies undertaken in a scientific manner have been identified by Yin (1989) and this has lead to wide acceptance of case studies as they encourage rigour. Inquiry using case studies in the natural science model of research are assumed to be value free and generalisable by literal and theoretical generalisability. This is accepted by many as offering validity.

4.2.2 The Interpretivist Paradigm

Interpretivist research consists of relatively fewer research articles than positivist and still has problems receiving credibility with the mainstream IS journals (Orlikowski and Baroudi 1991). Klein and Myers (1999) point out that interpretivism contains several streams, hermeneutics, deconstruction and post-modern. The most widely accepted and practised form of interpretivism in IS research draws on hermeneutics and it is this stream which is discussed below. The interpretive paradigm sees man as voluntaristic and holds concern with the way an individual creates, modifies and interprets the world. The ideographic method associated with interpretivist paradigm questions the positivist conception of an external reality and generally adopts an anti positivist epistemology. The positivist conception of knowledge is hard, real and capable of being transmitted in a tangible form. Anti positivist epistemology sees knowledge as soft, subjective even spiritual based on experience, insight and essentially of a personal nature.

The interpretivist approach is based on an ontology in which reality is subjective, a social product constructed and interpreted by humans as social actors according to their beliefs and value systems. Interpretivist research attempts to understand phenomena through accessing the meanings that participants assign to them (Orlikowski and Baroudi 1991). Thus interpretive methods of research start from the position that knowledge of human action is a social construction by human actors. Interpretivism is thus an epistemological position concerned with approaches to the understanding of reality and asserting that all such knowledge is necessarily a social construction and thus subjective. The interpretivist holds that the nature of reality is a social construction by human actors. The researcher attempts to describe, interpret, analyse and understand the social world from the perspective of the participants. The interpretivist does not rely on hypothetical deductions but rather seeks to understand social process by "getting inside the world" of those who are generating it. Interpretivist research rejects the notion of value free research and is not concerned with repeatability of an explanation. The interpretivist attempts to gain a deep understanding of the phenomena under study and acknowledges their own subjectivity (Walsham 1993, 1995).

1 Assessment of the Interpretivist Paradigm

The interpretivist paradigm has been subject to some criticism. Fay (1987) provides a summary:

Interpretivism does not examine the conditions (often external) which give rise to certain meanings and experiences. Secondly, there is an absence of the unintended consequences of actions, actions which cannot be explained by reference to the intention of human actors.

Thirdly, the interpretive approach does not address structural conflict within organisations and society. The perspective cannot address situations where participants' accounts of their actions are inconsistent with their actual behaviour and therefore cannot analyse the means by which actors can be blinkered in self understanding. Fourthly, the interpretive approach neglects to explain historical change; that is how a particular social order evolved and how it is likely to change over time. Fay (1987 p 96) notes that the perspective "systematically ignores the possible structures of conflict within a society, structures that would generate change".

2 Interpretivist Approaches To IS Research

Interpretivist research is commonly associated with qualitative methods but this discussion must be taken alongside evidence from researchers who have used quantitative (statistical) methods in interpretive research (e.g. Kaplan and Duchon 1988). There are several methodologies strongly associated with interpretivist research in IS but the most commonly adopted are action research and case study methods which will be discussed below. Action research gives practical as well as theoretical research and the researcher is actively involved in solving some issue or problem.

There are problems of loss of objectivity and clarity of interpretation as well as problems of loss of control of the theoretical framework in favour of pragmatic considerations. Also it is often wrongly confused with consultancy (Baskerville and Wood Harper 1996). Interpretivist case study methods (Walsham 1995) attempt to describe relationships which exist in reality. The method captures reality in greater depth than survey and deals with a larger number of variables. Interpretive case studies in contrast to positivist case studies reject the possibility of

an objective account of events, knowledge is viewed as a social construction. Interpretive case research aims to gain insight and understanding of the social phenomena under study and provide a coherent "story" which would be of interest and use to others. Following Walsham (1995), the story can never be wholly objective and thus is the "researcher's interpretation of other people's interpretations". The method is restricted to a single event and is often criticised over rigour, problems over maintenance of access and acquiring similar data from a meaningful number of organisations. Other criticisms include problems of different interpretations of reality by observers and difficulties with generalisability.

Another research methodology associated with interpretivism is Context - Process analysis (Pettigrew 1985a). This was derived from Pettigrew's work on change in organisations, it provides a combined interpretivist methodology and analysis strategy. Context process analysis is not the only approach to contextualist inquiry in IS research. Web Models (Kling and Scacchi 1982) and Soft Systems Methodology (SSM) (Checkland 1981) also offer valuable approaches to the study of context in the domain of information systems. Web models have been influential in providing a framework for analysis of the contextual influences on computerised systems. Researchers such as Walsham (1993) have found web models useful in making explicit the salient connections between a focal technology and its social and political contexts (Kling and Scacchi 1982 p.3). Web analysts examine the interaction between people and technology as part of a social and technical "web". For Kling and Scacchi, computing developments are seen as complex social objects constrained by context, infrastructure and history (p.69). This is interesting however the very fact that web models concentrate on computing developments is a disadvantage. Central to this inquiry is an ongoing process of information systems development that has many dimensions including the use of computers, but not centring on computing developments. However, the constraints

of context, infrastructure and history raised by web models are seen as pertinent and relevant to the inquiry.

The other major approach which could be described as having contextualist characteristics is SSM. SSM was discussed in section 2.5.1 with regard to SSM use in information systems. The methodology was originally developed as an approach to tackling management problems that were rich in complexity but it has since been used in information systems design (Lewis 1994) and in IS research (e.g. Alias 1997). A significant strength of SSM is in its interpretivist epistemological base meaning that problem situations are perceived through multiple perspectives. Checkland (1981) recounts his early research into SSM where highly complex problem situations involving many social and political issues often eluded hard systems analysis approaches. These issues are challenged by SSM users by drawing attention to softer aspects. Techniques such as rich pictures, root definitions and conceptual models represent the problem themes and varying weltenshauungen of the organisational actors. Conceptual models are used as a means for discussion between the participants comparing the real world to the "ideals" created in the model. Later versions of SSM included a political and cultural analysis (Checkland and Scholes 1990) which was designed to counter some of the criticism of SSM regarding in particular the methodology's attention to issues of power. SSM is well defined and is used extensively by a broad range of management practitioners and consultants. However, for the purpose of this inquiry, it was notable that there was no central problem or set of problems which the researcher was trying to "resolve". The position of the researcher was not one of consultant or action researcher and expecting organisational participants to engage in dialogue over conceptual models was not intended.

There were many aspects of web models and SSM that would be useful in the inquiry, the author was seeking an exploratory approach that would encapsulate the interpretivist spirit of SSM without the "problem solving" emphasis. An approach was needed which would capture multiple perspectives and pay attention to the cultural and political "web" surrounding the evolving process of IS development between the richly diverse Indian and UK context. A further requirement was for a methodology that would take account of the impact of context at various levels on the process and vice versa. These are features of Pettigrew's contextualist approach which also takes account of the bi directional relationship between the process and context issues at various levels.

F: Framework of ideas
Culture, cross culture and power
Globalising tendencies

A: Area of application

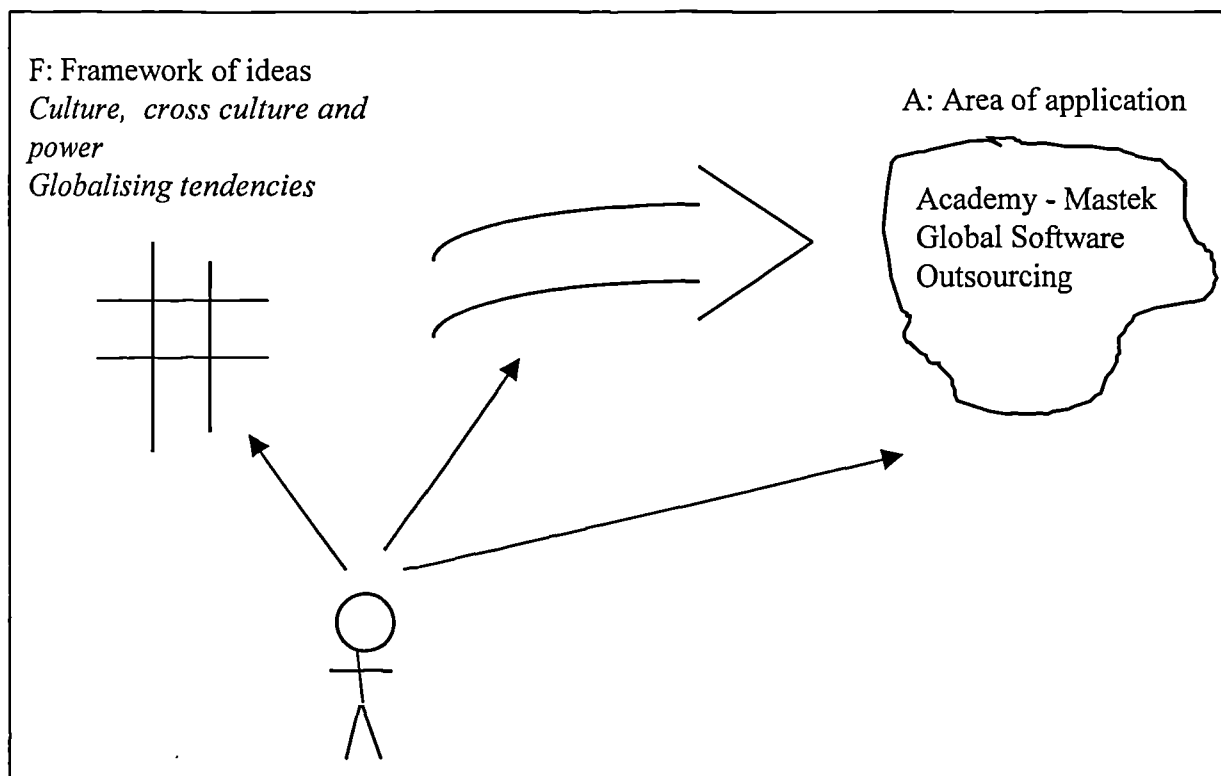Academy - Mastek Global Software Outsourcing

Fig 4.2 Elements of Research (Checkland 1991)

Pettigrew's contextualist approach encourages researchers to engage in longitudinal interpretivist research at various levels of analysis thereby uncovering dimensions of a process over time and at different levels. It could be described as a particular method of conducting

case studies as most results of context process analysis are written up as case studies. The methodology therefore suffers the same weaknesses but gives a greater depth and breadth of possibilities for research findings. The major weakness of the approach lies in the volume of data which would be produced and the workload for a single researcher in successfully identifying themes and relationships at multiple levels of analysis.

4.3 Justification for Choice of Research Methodology

Fig 4.2 above shows the key areas of consideration when justifying the research methodology. Checkland (1991) asserts that the research process involves the researcher, the theoretical framework (as articulated in the previous chapter), the area of application and research methods in IS. The author is of the view that the literature review should also be involved in the justification and choice of research methodology and thus the justification will consider each of these elements in turn. Firstly, the author's ontological position in examining the process of information systems development across time and space is primarily as a social construction. The author's epistemological stance for investigating the process is an interpretive one. By way of rationale for this, firstly, the author over time has come to have sympathy with the arguments over the social construction of reality and feels comfortable with that view. The author also feels sympathy with the interpretivist view of the construction of knowledge and rejects the positivist position discussed earlier. The author is in sympathy with the view that the methods of natural science are inadequate to study the complex multiple meanings and perspectives inherent in study of society and human relationships.

With regard to the theoretical framework, the literature review showed that studies which have been concerned with power in organisations have used interpretive case study methodology to

good effect which points to this being an appropriate strategy (e.g. Kern and Silva 1998, Lacity and Hirschheim 1993, Walsham 1993, Zuboff 1988). The complex interactions and multiple perspectives inherent in investigating issues of power and culture are poorly matched to the scientific approach. Power relations are essentially intersubjective, complex and multiple interpretations of events exist. Thus it is the author's view that there is no objective version of politics.

Investigation into issues of culture and cross culture are well suited to interpretivist approaches and once again the literature search showed the rich insight which came from longitudinal case study (e.g. Robey and Rodriguez Diaz 1989, Walsham and Sahay 1999). Analysing culture issues is concerned with the analysis of social reality, cultures are viewed as the result of created meanings between participants who "conspire" to create meanings, social and physical artefacts. Scientific investigation into such phenomenon would be reductionist and restrictive. With regard to investigating issues of cross culture, key writers such as Ein Dor et al (1992) in particular have called for more case studies in the area. Interpretivist case study methodology was used to good effect in studying cross cultural issues by Robey and Rodriguez Diaz (1989). Studying differences and effects of social reality and subjective meaning between cultures is not an exact science. People create and attach their own meanings to the world which is made increasingly complex when studying cross cultures. Investigating areas of culture and power require methods where the researcher can build the trust and confidence of the participants over time. Power relations are dynamic and change over time which calls for longitudinal study.

With regard to the area of application, the process under investigation is highly complex and the research questions are concerned with the study of a process which implies an holistic,

exploratory approach. Walsham (1995) indicates that interpretivist case study methodology is appropriate for inquiry into "how" type research questions. Scientific inquiry into the process would require generation of hypothesis and experimental methods inevitably involving reductionism. At the commencement of the investigation, it was unknown what themes would emerge from the investigation and therefore it would have been inappropriate to generate hypothesis. The process under investigation is viewed as primarily social and the research aims to capture the complex, dynamic nature of the social phenomena around culture and power issues which are both context and time dependant. It was therefore decided that investigation into a "real life" set of events would afford the most effective realisation of the research goals and question. The research attempts to understand the process in practice from the participants position with respect to their society, organisation, team process and at the level of the individual. Many writers involved in interpretive research which takes a process perspective suggest the need for a longitudinal design (Pettigrew 1990, Walsham 1995). The advantage of this is that it enables the researcher to study the actors' interpretations of the process as events unfold in real time and to gain trust so as to gain deep insight. This was considered to be important in this case.

Element of Research	Feature of Research Design	
Researcher	Sympathy with interpretivist epistemology	Comfortable with interpretivist approach and qualitative methods
Framework of Ideas	Studies of power and culture suited to interpretivist research due to multiple perspectives	Longitudinal research needed to build trust, deep investigation and allow themes to emerge
Methodology	Context process analysis allows holistic emphasis Literature on power and culture calls for more case studies	Influence of context and multiple levels of analysis important to show linkages "How" type research question calls for interpretivist case
Area of Application	Investigation into real life events would realise research questions (use of case study)	Highly complex process between India - UK context and exploratory emphasis call for holistic approach

Table 4.3 Summary of Justification for Research Design

145

4.4 Research Design

The author has argued that context process analysis is an appropriate method for longitudinal research associated with a study of information systems development across time and space. A summary of the decisions are shown in table 4.3. Walsham (1993) uses Pettigrew's (1990) context - process analysis to good effect. This section will show how this inquiry will utilise context process analysis in the form of a detailed research design. The components and prescriptions of context process analysis are discussed in the section below. The methodology has distinct similarities with the case study methodology and thus suffers from a number of similar criticisms such as problems with generalisation, rigor, problems of data reliability and validation, access and continuity. The research design treated these limitations in the following ways. Firstly, multiple primary and secondary sources were collected and separate interviewees were often questioned on the same themes to provide richness of interpretations. Interviews were taped and transcribed in full and a database of notes, transcripts and comments was maintained by the author. This was also found to be useful in avoiding post hoc rationalisation of events when engaging in historical reconstruction during the early stages. Triangulation of the research was thus found to be useful by using a variety of data sources. However the idea of "verification" of research results in interpretivist case study work is one which the author is uncomfortable with as it assumes the application of scientific methods. It is more appropriate to describe the richness of different interpretations of events which was key to achieving insights and reinforcing themes or adding new perspectives.

It is argued that interpretive research is not only useful at the exploratory stage but can be used for generalising results. Those that argue that the results from interpretive studies are not

generalisable usually attempt to impose the positivist notion of statistical generalisation on a research approach which has a radically different philosophical base to that of positivism. The ability to generalise case studies is seen by many as a major problem especially in the case of a single study. Case study research may adopt single or multiple case designs. A single case study is appropriate where it represents a critical case (it meets all of the necessary conditions for testing a theory), or where it has extreme or unique aspects where it is described as a revelatory case (Yin 1989 p 38). Single case studies allow researchers to investigate phenomena in depth thereby providing rich understanding and description (for example Markus 1983, Myers 1994, Walsham 1993). There are authors who argue strongly for generalisation of single case studies (e.g. Walsham 1995, Yin 1989) on the basis of a different form of generalisation i.e. analytical generalisation as opposed to statistical generalisation. Walsham (1995) argues that case study data can be valuable in providing explanations of past data but are not wholly predictive. Walsham's paper discusses four types of generalisations from case studies: the development of concepts, the generation of theory, the drawing of specific implications and contribution of rich insight. This classification was useful in developing generalisations from this research. In addition to this, as discussed in the previous chapter, the analysis of the research data will be informed by Giddens's (1990, 1991) analysis of globalising tendencies and identity in late modernity. Using this approach will enable reflection on the research themes potentially enhancing the generalisation. Walsham (1998) proposes that the use of "macro theory" such as Giddens's is useful as a means for learning and reflection but also that the generalisation potential of themes which emerge from a research inquiry may be enhanced if they correlate with macro theories:

"IS researchers need to continue to carry out detailed micro studies of IT in organisations, in order to present grounded evidence on how it is implicated in the transformations which are

taking place...If we are to try to generalise from these micro - studies, we need concepts and theories which transcend the particular case settings, and linking the micro-studies with macro theory is one approach to this problem of generalisation"

Generating and maintaining access is another problem which is often raised against the use of case study methods in IS research. This was problematic at times especially as the two companies participating in the investigation became involved in negotiations for a multi million pound "umbrella agreement" across the group. Access was maintained primarily by offering something of benefit to the interviewees. The author could not expect participants to continue to meet and spend time with him unless they were getting something of benefit from it. Thus the author planned an interim report and discussed issues of relevance to the companies when asked for opinion.

4.4.1 Context Process Analysis

Context process analysis was first proposed as an analysis method by Andrew Pettigrew (1985a) based around his work on strategic change undertaken at the University of Warwick. This has since been influential in IS research, for instance Walsham (1993) uses context - process analysis to good effect in generating several case studies involving implications of implementation of IS.

A strength of context process analysis are the case studies and guidelines which Pettigrew (1985a) produces for those who would use the approach. In context process analysis the process under investigation (in this case information systems development) is considered to be set within the context of an organisational environment which in turn is set within the context

of an external environment (legal, social, political, economic, educational and commercial). The process interacts with and is constrained by the organisational environment but it is not a fundamental part of the organisational structure itself. However, the environment surrounding the process is shown to define the purpose, constraints and resources available (Pettigrew 1990).

Context process analysis proposes a holistic research process that is comprised of several general characteristics listed below in table 4.4. In this section in order to detail research method, the author has attempted to articulate how these principles were put into practice in the actual inquiry.

- A set of levels of analysis which are clearly delineated but theoretically and empirically connectable.

- Within each level of analysis a set of categories are specified.

- A clear description of the process under examination.

- A motor or theory to drive the process including the model of human being underlying the research.

- The contextual variables and categories are linked to the process under investigation.

- The approach recognises that process is both contained by and shapes structures either in the direction of preserving them or in that of altering them. Structure and context are seen as not just barriers to action but as essentially involved in their production.

Table 4.4 Features of Context Process Analysis

The levels of analysis used in this inquiry are shown in table 4.7 and 4.10. In table 4.7, the levels of analysis are delineated but the categories are transformed into a series of questions which were used to start initial data collection. The categories for investigation were not thoroughly understood until later in the investigation. Figure 4.10 shows how the process of

research took place using context process analysis. A clear description of the process under examination is thoroughly articulated in chapter five. It includes a description of various structural conditions at different levels of analysis. The "motor or theory" to drive the process was discussed and justified in the previous chapter, a study of the cultural and political issues across time and space will provide deep insight over time. The model of human being refers to the ontological and epistemological positions described above in this chapter and the linkage of the context to the process (information systems development) is achieved in the following chapter. Fig 4.5 shows how Pettigrew (1985a) envisages the inner and outer context are linked to the process itself and indicating how the researcher should show how process outcomes are varied by the context. In this inquiry, the importance of contextual factors (e.g. Indian infrastructure, cultural conditions) are clearly shown to be linked to the outcomes of the process of information systems development. The theoretical framework is used to express this.

Furthermore, the approach recognises that process is both contained by and shapes structures either in the direction of preserving them or in that of altering them. Structure and context are seen as not just barriers to action but as essentially involved in their production. This idea of the dualism of structure is shown to good effect in the case study where power relations are seen to change structures and vice versa.

These references to the importance of contextual structures; the dualism of structure and the bi directional effect between context and process are strongly reminiscent of themes described in Giddens's structuration theory. In fact this is no coincidence as Whittington (1992) draws attention to Pettigrew's (1985b) use of structuration theory in *The Awakening Giant* case

study of ICI. Structuration theory (Giddens 1984) is also used by Walsham (1993) when utilising contextualism as a means to linking the context and process.

Structuration theory may be seen as an attempt to resolve a fundamental division within the social sciences between those who consider social phenomena as products of human "agents" and others who see them as caused by the influence of objective exogenous social structures. Giddens attempts to reconcile this by positing that social structure is drawn on by agents in their actions while the actions are seen to produce and reproduce the social structure. Structure is not just a constraint on action but also a resource to be deployed. Giddens identifies three dimensions of structure described as signification, domination and legitimation. These interact through modalities of interpretative schemes, resources and norms with human action of communication, power and sanctions. Giddens emphasises that structures exist only in the mind and through actions of humans. Giddens is not taking an essentialist or deterministic line, the structures exist as "memory traces" but they retain agency and are able to behave outside of the structural norms. This leads to a view of human beings as being in a constant state of reflexive monitoring of their situation and to the constant potential for change (Jones 1999). Pettigrew sums this up argues that there are two major ways in which a contextualist analysis can contribute:

"First of all by conceptualising structure and context not just as a barrier to action but as essentially involved in its production and second, by demonstrating how aspects of structure and context are mobilised or activated by actors and groups as they seek to obtain outcomes important to them" (Pettigrew 1985b p37 cited in Whittington 1992).

The constraining and enabling nature of structure is stressed as is the notion of power which is a concern within structuration theory. Another facet of structuration theory which is also of relevance to contextualist inquiry concerns the relevance of overlapping structures and systems. Whittington (1992) expresses this in relation to agency derived from options presented by the overlapping of various structural rules and resources:

"Managers and managed alike are also people, who, as full members of society, operate in a diversity of systems, and are therefore able to draw upon and respond to a multiplicity of rules and resources. Moreover the boundaries of firms cross-cut and overlay the boundaries of many other systems, particularly those of communities and states" (Whittington 1992).

The importance of this to a contextualist inquiry across two countries is obvious. Where production is split between India and UK and teams are multi cultural this facet of structuration theory offers insight into the social systems and structural bases for action present in such situations.

Context variability   Process variability   Outcome variability

Outer context   1

                                                           2

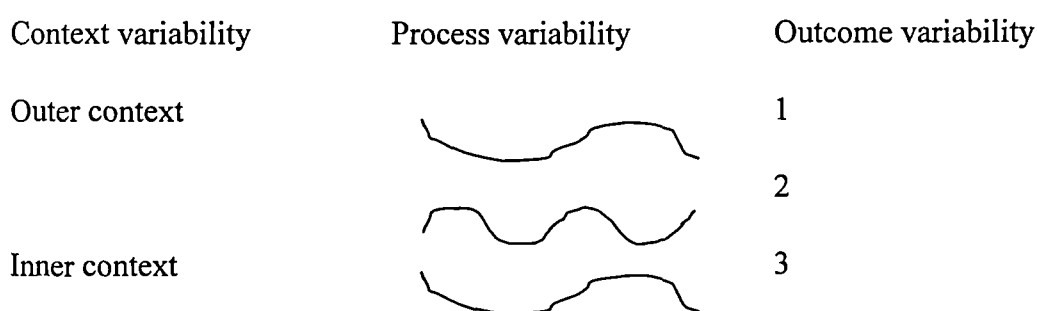Inner context   3

Fig 4.5 Component Of Analysis: Context And Process

Moving to a discussion and consideration of the practicalities of the method itself, Pettigrew (1985a) describes 6 key steps in adopting the contextualist analysis shown in fig 4.6.

- Describe the process under investigation.
- Expose variability or constancy between the processes (shown in Fig 4.5 by different curved lines).
- Begin the analysis of the processes by using existing theories of process or develop new ones.
- Begin the task of pinpointing the levels of analysis in the context and some of the categories or variables in those levels of analysis (e.g. are the levels in the context to be restricted to features of the intraorganisational context through which the processes immediately flow or will outer context be of relevance such as socio economic conditions).
- Begin the task of describing and analysing variability across the contexts through which the processes are unfolding. Describe and analyse trends and developments in the various contexts over time.
- Consider the alternative criteria that can be used to judge the outcome of the process under study.

Fig 4.6 Six Steps in Contextualist Analysis

The description of the process under investigation is shown in the following chapter. With regard to the variability or constancy between the processes, the various levels of analysis are shown in Fig 4.7. The various effects of the outer context (e.g. staff attrition due to volatile Mumbai market) was seen to have wide effects on other levels of analysis (e.g. exposing interesting risk issues).

The "existing theories of process" concern the theoretical framework but also IS development methodology, theories of CMC and other dimensions of the literature search. The levels of analysis in the context and some of the categories or variables in those levels of analysis are shown in fig 4.7 and 4.10 and were identified quite quickly (within 2 - 3 interviews). The most significant level of analysis was the project group which was of key importance. Pettigrew's recommendation on "describing and analysing variability across the contexts through which the processes were unfolding" and "description and analysis of trends and developments in the various contexts over time" was done by interviewing, repeat interviewing and thinking carefully about the theoretical framework in relation to the events as they unfolded. The following chapter contains the analysis divided into levels showing themes described through the theoretical framework and organised in time periods.

With regard to the alternative criteria that could be used to judge the outcome of the process under study, the author did investigate the criteria which are set by the case study organisation to monitor the outcome of the process and this is discussed in the following chapter.

In short the approach is concerned with identifying the relationships among variability in context, variability in process and variability in outcome. This was appropriate for the inquiry as the approach is well suited to longitudinal study, is holistic and non reductionist; accommodates multiple world view and it has an emphasis on the importance of context and its relationship with process. Fundamentally, context process analysis concentrates on richness of insight using a contingent emphasis meaning that it uses a choice of theory or theories to analyse data. Interestingly, Pettigrew states that the researcher should come to the field situation equipped with a number of theoretical concepts which could be used to analyse the data. This means that the researcher should not presume what events will unfold during the course of the investigation and will need a range of theories to help to analyse and understand these events.

The major disadvantage of the approach is seen to be the large amount of data to collect which is in many cases unstructured following qualitative data gathering. The second disadvantage is the need to be equipped with a number of different research frameworks to analyse the data. This approach is appropriate as in a holistic inquiry one does not know what issues, concepts and themes will emerge during the course of the investigation. This would be particularly well suited to multi disciplinary teams of researchers who could bring a number of theoretical models to bear on a given situation and the issues as they emerge. However, for a novice

researcher necessarily working alone with limited theoretical knowledge available, this contingent emphasis can be rather intimidating. To learn, understand and apply theories according to the circumstances is an exhaustive process. However, upon reflection on the research questions, the author felt that this was a valuable approach which would offer deep insight in the situation under investigation which was of paramount importance.

4.4.2 Site Selection

The decision to base the research around the Indian software outsourcing industry was as a result of a number of factors. During the course of the project, the author received advice and guidance from Dr. Sundeep Sahay who is himself engaged in larger scale research into software outsourcing to India. It was considered interesting to do comparative work. The site was selected firstly through a literature search which lead to a number of companies who were engaged in the outsourcing of software to India. Roughly 10 companies were contacted with varying results from telephone discussions. Dr. Richard Heeks a researcher at Manchester University with a record in examining the Indian software industry was contacted who provided several names of companies he had already had dealings with. This made the access problem somewhat easier. With regard to the criteria used to choose the case study organisation, as Dr. Sahay's work was with very large companies operating from Canada it was considered interesting to examine a relationship with a small to medium sized organisation in order to compare and contrast the issues. The second factor concerned the relationship between client and software outsourcing company. Chapter two outlined Heek's (1996) relationship continuum model for software outsourcing. It was deemed desirable to select an organisation which had a relationship which was less developed than that of the case study under progress with Dr. Sahay in order once again to compare and contrast issues. The

final stipulation was that the case study should have a UK based client for convenient access for the author but also so as to contrast issues between UK-India and Canada-India. Pragmatically, the author was looking for an organisation which fulfilled these criteria but also was prepared to offer access for a period of one year.

Direct contact was made by telephone and letters were sent to both the outsourcing company and their clients which were followed up with telephone calls. The author made appointments to visit potential organisations in the hope of finding a suitable case. Access was finally granted by directors of Mastek, the Indian outsourcer, who introduced the author to their client Academy Information Systems, a UK based software house part of the large Capita Group. The author also engaged in a number of interviews whilst on a period of secondment to the Indian Institute of Management, Bangalore during July and August 1998. This helped to fill in many contextual details to the Indian software industry.

4.4.3 Data Collection

The author's previous experience as a sales consultant has given useful skills for interviewing such as listening skills, asking relevant questions and having necessary social and political skills to maintain credibility (Yin 1989). The in-depth case study included both historical reconstruction and semi structured interviewing of current events. The period from the onset of outsourcing from 1995 was reconstructed from interview data and using real time interviewing from November 1997 to December 1998. Data collection consisted of a number of primary and secondary sources considering the various levels of analysis concerned with the process of information systems development (shown in Fig 4.7). Primary sources included interview transcriptions, mission statements and corporate plans, newsletters and annual

reports. Secondary sources included sectoral studies, trade journals, newspaper supplements

and articles. Discussion with colleagues and advisors also figured highly in this data

gathering and in particular with the analysis process .

individual Level of knowledge, needs, motives, cultural background.	*project level* Activity types, has activity changed over time, onshore / offshore mix / how important is the work they do document the nature of projects how is work organised, procedures / standards / documentation / motivation / communication. Team organisation / interaction / control / reward / schedules.
organisation level Organisation chart showing sub systems /management structure / formal goals / strategies / control and authority mechanisms / organisational form / hierarchical relationships / decision making processes / biographical details of key leaders / production processes and sequence / sales / customers / profit. Arrangements: the nature of the outsourcing arrangement / why not local outsourcing / intellectual property. How key is the software being produced to the marketplace / market position. Outsourcing selection procedures, criteria used. HR Strategies: retention / career structure / schemes around HR.	*use of IT* Document usage of IT, how are technologies used, co-ordination and control: with UK, how have they led to a change in work, speed up project times. Alienation, problems issues.
	industry level and the wider system Industry level issues in environment, competitors, maturity, time in market. Characteristics of physical locale. Broad socio economic conditions. The group and other companies. Competitive pressures.

Fig 4.7 Levels Of Analysis Within The Process

The principal method of data collection was through qualitative techniques in particular semi

structured interviewing. These interviews were conducted with participants at the various

levels of analysis. Mostly they were with individuals but during fieldwork in Mumbai, a

number of group meetings were held with programming staff. The interviews were recorded

by the taking of copious notes in the meeting which were written up in full as soon as possible

after the interview. Initial " fact finding" interviews were tape recorded and transcribed in

full.

There was no appreciable fear of the tape recorder with most of the people interviewed

although they were always asked whether they objected to being taped. A special small

dictation machine was purchased which was usually slotted out of sight once the interview had started and interviewees usually forgot it was there. In order to bring out the subtleties of Morgan's "is" view of culture, the informal organisation was a key source of information on the "spirit" of the organisation. So as well as categories identified by Davis (1991), the author would draw on ethnography (Fetterman 1989) and spend large amounts of time in observation, coffee rooms, smoking with participants in corridors, engaging and participating in discussion, gossip, jokes and conversation.

Table 4.8 shows the breakdown of interviews in Trowbridge (UK) and Mumbai. Semi structured interviewing in these locations was supplemented by a number of interviews with organisations in different sectors of the marketplace whilst on secondment at IIM Bangalore during August and September 1998. Five software companies were contacted and interviewed as well as numerous discussions with colleagues and students at IIM. The semi structured interviewing in Mumbai and UK was supplemented by informal interviewing and observation in coffee rooms and other informal settings. One useful prop was the smoking of cigarettes, the author is not a regular smoker but found that engaging in a smoke with interviewees usually in a place removed from the office led to insights when they told the "real story" about what was going on! In this way, the research approach drew on ethnographic techniques (Fetterman 1989) and was found to be particularly useful in Mumbai. Access to coffee rooms, informal areas and canteens was found to be more difficult at Academy than at Mastek in Mumbai. Most interviews at Academy were in formal settings with fairly strict timescales whereas in Mumbai the author was given much greater freedom to observe, discuss and informally converse with managers and employees.

4.4.4 Analysis Strategy

The analysis of the data involved a constant interaction between the theoretical framework outlined in the previous chapter and the data as it came in. This process broadly followed that described by Walsham and Sahay (1999). The data was analysed at the various levels of analysis and the identification of themes, concepts and issues was achieved over the period by careful reflection on and reading of the field notes. Frequent discussion with colleagues on the emerging themes helped to crystallise themes which were reinforced with Dr. Sahay during occasional meetings or by telephone and email. The diagram Fig 4.9 shows this process of theme identification. The themes and concepts were also discussed with the case study organisation and an interim report was produced for them which stimulated much discussion.

The data was collected from interviews and secondary material from November 1997 through to December 1998. The longitudinal approach gave time for themes to emerge and thoughts to crystallise regarding the evolving relationship. Interviews took place with staff at all levels of the organisations, some were planned in advance others were opportunistic or took place in corridors, over meals or even in the street. Fieldwork included a visit to Mumbai in February 1998 for interviews with staff in the Indian organisation. The interim report which was produced for both companies during May 1998 is included in the appendix. The table below shows the number of interviews and the position of the interviewee.

	Academy & Mastek Trowbridge					Mastek Mumbai 2 day field trip Feb 1998	Total
	field trip 1 11/97	field trip 2 12/97	field trip 3 1/98	field trip 4 8/98	field trip 5 12/98		
Senior	1	2	2	2	2	6	15
Middle management	1	1		1		2	5
Programmers		2			1	7	10
							30

Table 4.8 Interviews, Number And Level Of Interviewee

In generating themes, in common with Walsham and Sahay (1999) formal structured methods were not used to identify the themes since, in the author's opinion, the complexity of the field data did not lend itself to these often reductionist approaches. However the earlier stages of the research involved more open ended interviewing whereas the later stages were more closely directed towards the emerging concepts and themes. The theoretical framework described in the previous chapter includes the use of cultural and political analysis and the writings of the sociologist Anthony Giddens concerning globalisation. In practice, this theory was used as a "scaffolding" to help the analysis which could be removed once the analysis was complete (Walsham 1995). It also enabled micro and macro analysis in that there could exist an analysis of themes "emerging from the data" but also a macro level analysis acting as a vocabulary to interpret, describe and structure areas worthy of further investigation.
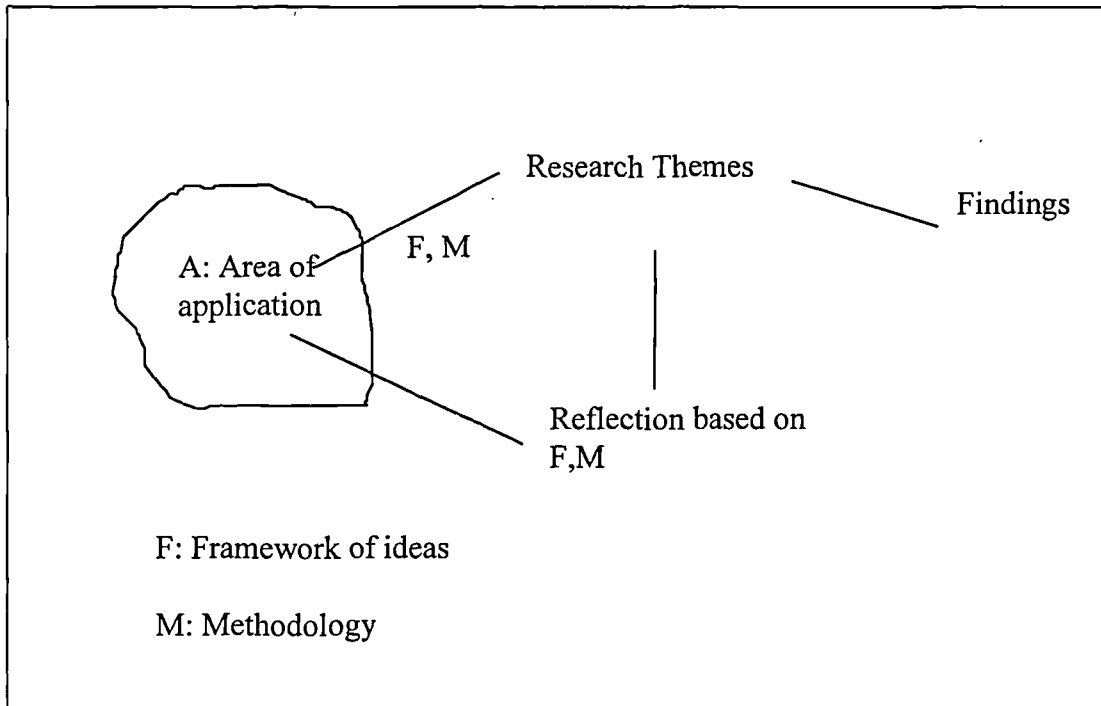
Fig 4.9 Generation Of Research Themes (Based On Checkland 1991)

4.4.5 Role of the Researcher

The final part of this chapter concerns the role of the author as researcher dealing first with the position of the author as an Englishman in India and the changing role over time. On the author's first visit to India several years ago, the enduring memory is of the "culture shock" experienced on entering and living in India for the first time. Subsequent visits including fieldwork in Mumbai and lecturing at IIM Bangalore did not have the same "shock" but nevertheless sensitised the author to the cultural differences. This contributed to the research inquiry in a way which may not have been possible for an Indian researcher. For instance the relatively passive nature of Indians was reflected in the absence of road rage incidents in such hectic crowded city traffic which is often complicated by perambulating and resting animals. On discussion of this with Indian colleagues at the IIM Bangalore, the author's amazement

with this contrasted with the view of this as being the usual state of affairs   Thus being a cultural "outsider" perhaps helped the author to "see" things which were usual and thus invisible to Indians.

With regard to the author's role as interpretivist researcher, there exists a continuum of positions from the role of independent observer with a descriptive objective through to the prescriptive, involved stance of the action researcher. In this study the author moved between the roles as time went on. The research started in a typical independent observer role moving in a more action focused role and back into independent observer. This depended largely on the political relations between the two companies and the proximity to a interim report or discussion of research findings. Research impressions and feedback were given on a regular basis both verbally and via a formal written report which was requested. As indicated by Walsham and Sahay (1999) this involvement is an essential aspect of longitudinal study. Participants would not be willing to see a researcher on a number of occasions if they felt that opinions would never be given on issues. The author also felt a moral commitment to feedback given the nature of the research findings.

M Horizontal level of analysis (time)

Power   Culture and cross culture   **F**

Macro theory concerned with globalising tendencies

Reflection on F,M,A generation of themes

M Vertical Levels of analysis

Context

Organisation level

Project level

Individual level

Usage of IT

Process of software development at

Academy (UK)

Mastek onshore

Mastek Mumbai
A

Results
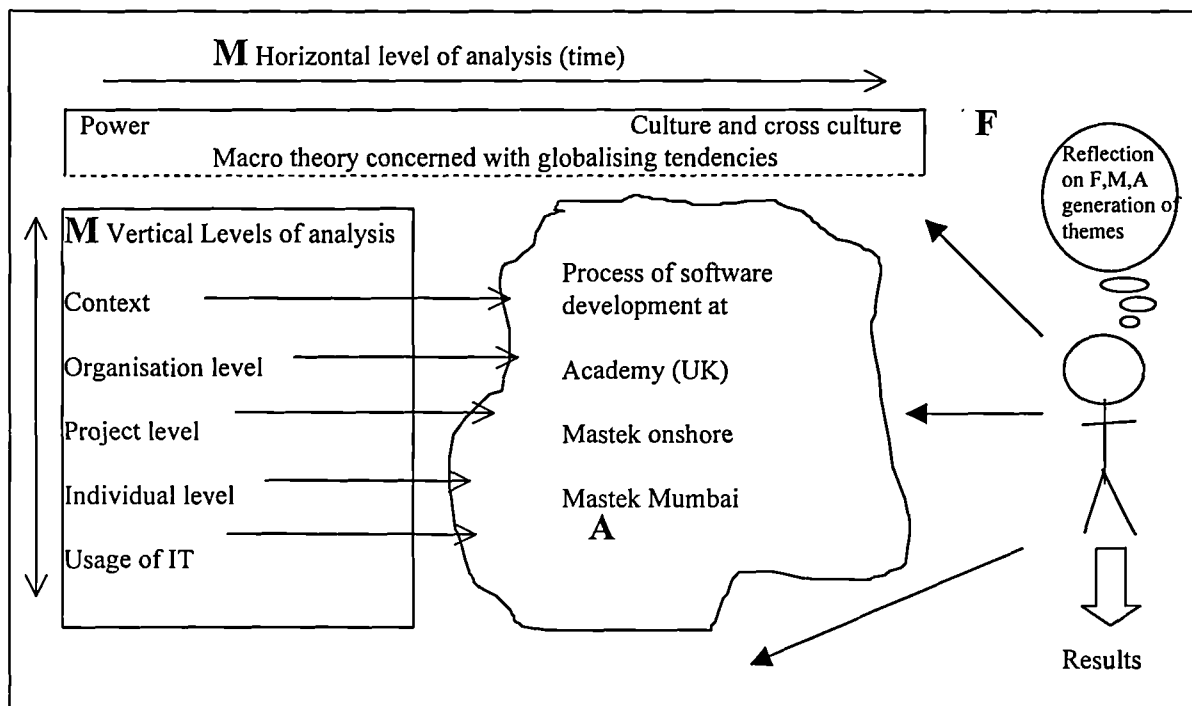
Fig 4.10 Diagram Showing the Theoretical Framework (F), Vertical and Horizontal Levels of Analysis (M) to Investigate the Process of Information systems Development At Academy & Mastek.(A)

4.5 Summary of the Chapter

This chapter has been wide in scope. The previous chapter outlined the reference theory which has been combined to form the theoretical framework for the investigation. A combination of literature on culture and power in organisations was reviewed which would enable an emphasis on the cultural, cross cultural and political dimensions to the study. The section also outlined the work of Giddens (1990, 1991) which is concerned with globalising tendencies and will allow the study to consider the implications from the perspective of macro theory. This chapter outlined the ontological and epistemological assumptions which are

made by the author in the inquiry. It also considered the appropriate research methodology to be used as a "motor" to drive the investigation. Interpretivist context process analysis was chosen as the preferred approach because of its holistic approach and emphasis on longitudinal study. The chapter ended with a discussion of the specific methods which were planned and used together with discussion on the principles which "operationalised" context process analysis in the field inquiry. Fig 4.10 shows how the theoretical framework, the methodology and the area of application came together over time to produce themes and results to form the research inquiry. In effect, this diagram is a summary of the interaction between the research methodology discussed in this chapter and the theoretical framework discussed in chapter three. The theoretical framework is shown above the vertical levels of analysis with a dotted line showing that there was a constant interaction between the framework and research data as collected and interpreted in the mind of the researcher. The various vertical levels of analysis under investigation in the case study in the UK (Academy and Mastek onshore staff) and in India (Mastek) are shown as arrows pointing to the area of application representing the case study participants and organisations. The horizontal level of analysis concerns the 12 month research period chosen for longitudinal study. The "stick man" figure represents the researcher who interprets the results guided by the methodology, engaging in dialogue between the framework and field data in order to generate themes. The next chapter will show this process in action in the form of a contextualist case study of the process of information systems development across time and space together with an evaluation of this in chapter six.

CHAPTER FIVE

THE CASE STUDY: INFORMATION SYSTEMS OUTSOURCING TO INDIA

5.1 Introduction

In this chapter the main empirical work is presented. The format for presenting this will be at the various levels of analysis starting with the outer and organisational context of the case study. This is followed by a discussion of events and a related analysis discussed in relation to time periods. Firstly an historical reconstruction of events from 1993 - 1996 leading up to the outsourcing of information systems development is presented. Following this is a description of events from outsourcing of information systems development up to the end of the study period in December 1998 at the various levels of analysis .

Analysis of events consists of interpretations concerning main themes arising in the ongoing relationships at the various levels of analysis. Relationships between various stakeholder groups are described followed by the culture analysis divided into cultural context between 1995 and 1996 and the period 1996 to 1998. The political analysis is similarly divided into the same time periods. The final part of the analysis uses Giddens writings on globalisation to discuss issues and draw out further important issues. The description of events and the related analysis begins to mould together at times and this is deliberately a result of the removal of the conceptual scaffolding (as described by Walsham 1995) and in an attempt to make the "story" less linear, more readable and interesting for the reader . At the end of the chapter

there is a summary of the analysis and the consequent recommendations for change to the theoretical framework.

5.2 Overview Of The Companies

Academy Information Systems are a software house part of the large Capita group of companies. Fig 5.1 below shows the organisation chart of Capita Group.

```
                        ┌────────┐
                        │ CAPITA │
                        └────────┘
            ┌───────────────────┴───────────────────┐
   ┌─────────────────┐                    ┌──────────────────┐
   │ Business Services│ £160m             │ Property Services │ £40m
   └─────────────────┘                    └──────────────────┘
```

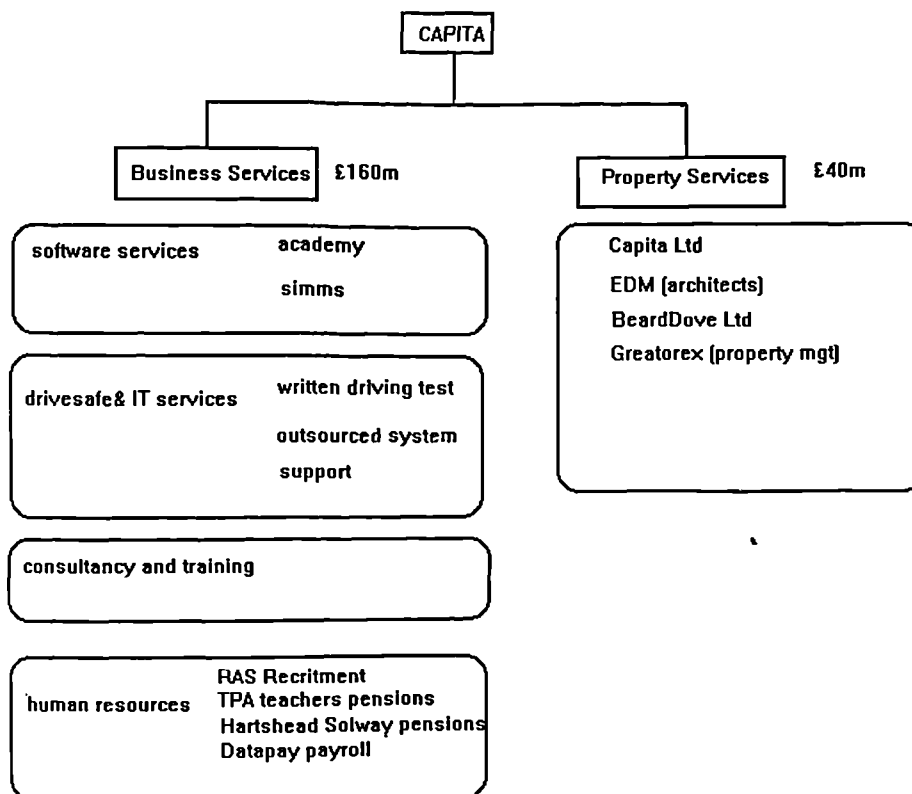|	
software services academy simms	Capita Ltd EDM (architects) BeardDove Ltd Greatorex (property mgt)
drivesafe& IT services written driving test outsourced system support	
consultancy and training	
human resources RAS Recritment TPA teachers pensions Hartshead Solway pensions Datapay payroll	

Fig 5.1 Capita Organisation Chart

Capita is one of the UK FT Stock Exchange top 250 companies with an aggressive entrepreneurial acquisitive style. The group was formed from a management buyout in 1984 the nature and success of which has had a lasting effect on the entrepreneurial, acquisitive

nature of the group. An overview of the evolution of the group is shown in Fig 5.2. The Capita Group Plc claims to be one of the fastest growing professional services organisations in the UK and in 1996 achieved a turnover of £106 million which has increased to nearly £200 million in the following year. The group operates as a single entity providing their customers with a wide range of skills . The core business of the group is the provision of complete outsourced solutions. Capita's key activities are shown in Fig 5.3 below.

1984	Capita Formed as a management buyout
1989	USM floatation
1991	Listed on London stock exchange
1992	Acquired Estate Design and Management
1994	Acquisition of SIMMS Holdings, Beard Dove, Formation of Academy Information Systems
1995	Contract for managing written driving test
1996	Contract for managing teachers pensions scheme

Fig 5.2 Evolution of Capita

The Board of Directors of Capita is made up largely of executives with an accountancy background. The stories and legends surrounding key inspirational leaders such as Rod Aldridge OBE and Group Managing Director Paul Pindar set a competitive backdrop to operations.

Property and Management Consultancy				
Customer Services	*Business support services*	*IT Services*	*Recruitment*	*Site services*

Fig 5.3 Capita Services

Academy is part of the business services section of Capita and located with another Capita company "SIMMS" in the software services section. In early 1998 the managing director of Academy was promoted to the position of head of the software group and therefore took control of both SIMMS and Academy. SIMMS are primarily involved in the production of educational software to be sold into schools.

Academy was founded in 1995 as a the result of the acquisition of a series of software companies and their related products. In 1998 Academy employed approximately 100 staff and turnover around £10 million which makes a contribution of around 10% of the group profitability. Although part of the Capita group, Academy are a PLC and are run separately from Capita. The reason for this is largely to do with allaying the fears of local authority concerning any agreement they may enter into with Capita or Academy leading to information sharing between group companies. They are situated in Trowbridge in what was once West Wiltshire District Council offices. Fig 5.4 below shows the organisation of the company.
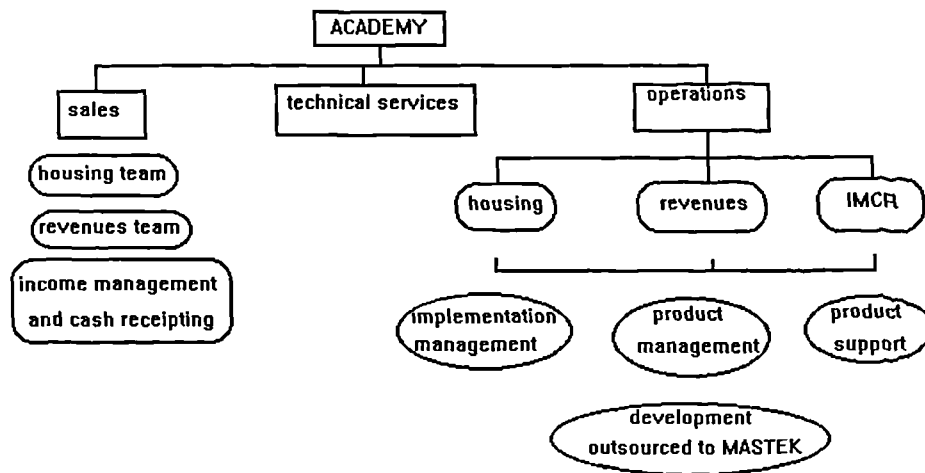
```
                        ┌──────────┐
                        │ ACADEMY  │
                        └──────────┘
        ┌───────────────────┼───────────────────┐
   ┌─────────┐      ┌─────────────────┐   ┌─────────────┐
   │  sales  │      │ technical services│  │ operations  │
   └─────────┘      └─────────────────┘   └─────────────┘
  ( housing team )                    ┌────────┼────────────┐
                                  ( housing ) ( revenues ) ( IMCR )
  ( revenues team )                   └──────────┼──────────┘
  ( income management            (implementation) ( product )  ( product )
    and cash receipting )        ( management )  ( management) ( support )

                                        ( development
                                          outsourced to MASTEK )
```

Fig 5.4 Academy Organisation

Mastek are a Indian software outsourcing company with a "software factory" located in Mumbai serving the USA, India and Asia Pacific regions. They were established in 1982 and went public, listed on the Indian stock exchange in 1992. Mastek UK are located both as part of the software factory in Mumbai but also within an administrative centre in Bristol UK. The company turns over around £16 million across the group. Approximately 120 staff are employed in UK operations. Mastek are among India's top 15 software exporters and has enjoyed substantial growth in particular to the international market.
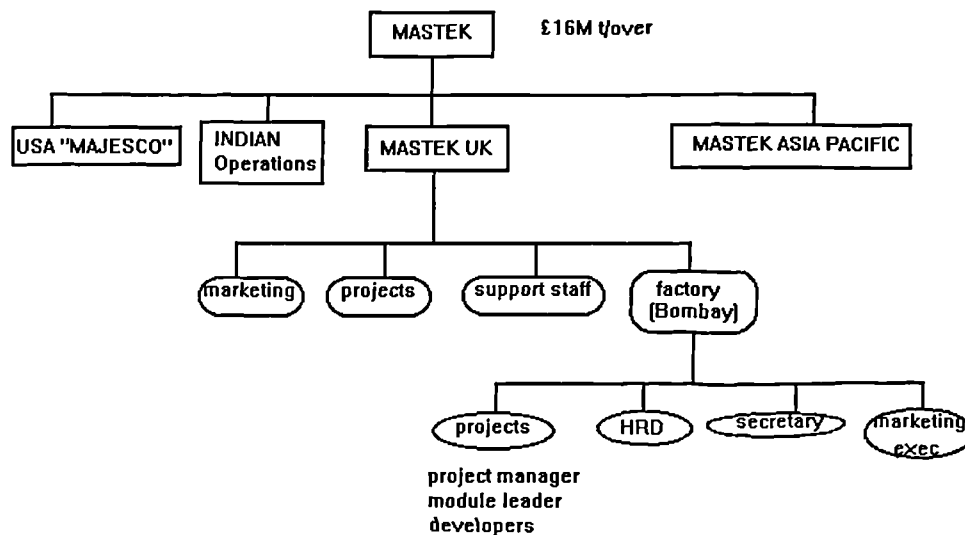
```
                    MASTEK     £16M t/over

    ┌──────────┬──────────┬──────────────────────────┐
USA "MAJESCO"  INDIAN    MASTEK UK           MASTEK ASIA PACIFIC
              Operations
                              │
              ┌──────────┬──────────┬──────────┐
          (marketing)  (projects)  (support staff)  (factory
                                                      (Bombay))
                              ┌──────────┬──────────┬──────────┐
                          (projects)  (HRD)  (secretary)  (marketing
                                                            exec)
                          project manager
                          module leader
                          developers
```

Fig 5.5 Mastek Organisation

5.3 Historical Reconstruction Of Events 1993 - 1996

Early interviews in Trowbridge focused on an historical reconstruction of events examining

the period at the inception of Academy as a company and leading to the rationale for

outsourcing. In 1993 West Wiltshire District Council (WWDC) attempted a management buy

out of its software product for council tax, benefits administration and business rates. When

the Government introduced the so called "poll tax", WWDC were one of the few councils

who were able to develop software themselves and offer it to other district councils. This was

a significant advantage and gave the Council a head start in the poll tax administration

marketplace. The people involved staged a management buyout but the public auditor

deemed it fraudulent and WWDC were forced to take the development back in house.

Considerable instability followed and the Council became keen to divest its asset.

Capita made an offer for the software business in 1993 and bought West Wilts Software, as it was then known. The following year the present managing director, Peter Kelly, joined the company and acquired the rights to a housing product from Sherwood Computing. Later that year Kelly acquired a small company called Dataflow which had a cash receipting product which complemented the existing portfolio.

Academy's first office was in Trowbridge in the ex WWDC offices trading for the first time in 1995. Thus, the Academy product portfolio consists of a housing product bought from Sherwood and Dataflow and a revenues product from West Wiltshire District Council. There is also an Income Management and Receipting product which is involved in outsourcing but to date is outside of the study.

The outsourcing of software development was initiated in November 1995 by Peter Kelly. The motivation for outsourcing was primarily a resource issue with a desire to tap into the large Indian software manpower pool. It was recognised that tapping into this pool could offer a logistical advantage in that people can be found at short notice as well as recognition of a high level of English literacy. There was also the benefit of a large number of computer science graduates and lower costs as staff in UK tend to cost on average 30% more than Indian programmers. Cost was not the major motivation in Academy's case however. Academy's poorly regarded geographical position coupled with a countrywide shortage of experienced programmers left it vulnerable to the skills threat. Programmers were not willing to live and work in Trowbridge because it is perceived to be a town in decline which is inconveniently located with few attractions associated with city dwelling such as cinemas, restaurants etc. Interviews with several staff indicated :

"there is very little to do here in the evenings and weekends, it is dead"

"it is like dole - on - sea, there are many unemployed"

Academy is the only major software company in the local area and thus relevant skills were not close at hand. At the time of outsourcing, there was a shortage of computer software skills generally in the UK and therefore it became increasingly difficult for Academy to attract and retain staff. Existing staff would be keen to move to city locations for higher salaries and promotion prospects.

There was also the need to form a coherent organisational culture as Academy, part of the acquisitive Capita Group, is made up of a series of corporate acquisitions. Staff who came with these different acquisitions had a very different views of organisational life and of how software development should take place. There was a desire in the new Academy management to form a homogenous disciplined work culture with an emphasis on efficiency and quality. This factor was a major motivation for Indian outsourcing and for using Mastek and so the outsourcing activity began with 4 Indian Mastek programmers on site at Trowbridge who were assisting with workload in the housing product. This introduced the Mastek Quality methodology (a waterfall methodology similar to SSADM (Downs Clare and Coe 1992) which is consistent with ISO9001 accreditation) which prescribes a structured, disciplined approach to development and project management. As Academy management increased their trust in the competence and capability of Mastek programmers the Mastek staff took over the Academy housing product development and part of the work was transferred offshore with some key staff remaining onshore. As Mastek programmers showed

competence in housing development, the Mastek methods and employees were subsequently "rolled into" Academy housing. This led ultimately to the resignation of the West Wiltshire District Council programming staff and complete adoption of the Mastek methodology and staff for all development work in Academy IS. A period of intense development took place until the products were seen to be well understood and robust. The housing and revenues products are now wholly developed by Mastek staff.

5.4 Events 1996 - 1998

Since the initial upheaval of the inception of outsourcing, the resignations and reorganisation, the Mastek - Academy relationship has become closer moving from a "bodyshopping" model to one where considerable responsibility is handed to Mastek staff for all development work at Academy on a time and materials basis (see chapter 2). The two companies have intermeshed their activities leading to a relatively static arrangement although they have experimented with levels of onshore / offshore development. These developments are considered in the section below which describes the major relevant dimensions of the relationship and acts as a foundation for the analysis.
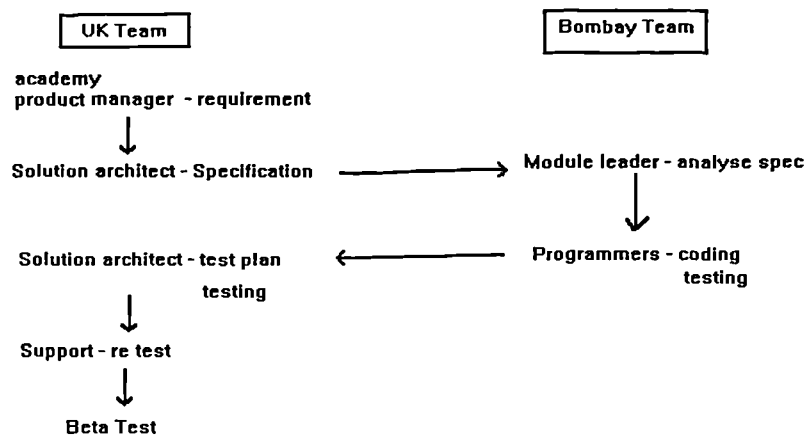
Fig 5.6 Mastek Software Development Process

5.4.1 Project Team Organisation 1996 -1998

At the level of analysis of the Project team, the Mastek teams are organised into offshore and onshore teams with the optimum structure at the time of writing deemed to be one third onshore two thirds offshore. The work taking place offshore tends to be purely programming work. The offshore team receive structured technical specifications which are compiled by the product manager, a non technical role specialising in understanding and communicating requirements, and solution architect, an experienced systems analyst. The technical specification is sent to Mumbai and the module leader, a senior programmer, distributes the work within the team. Code is written, reviewed, tested and subsequently returned to the UK where the solution architect will retest before beta testing at the client site. A copy of the full module is kept on site by the offshore team.

Following the initiation of outsourcing, Mastek were able to move up the "trust curve". This was achieved by the Mastek staff being perceived as performing well in the bodyshopping activities and subsequently taking over the two modules. A new contractual relationship was initiated and the project was moved to the onshore offshore model. An attempt was made in 1997 to move more staff off shore (the current balance is roughly 1/3 onshore the rest in Mumbai) which was unsuccessful. Operations to this point had on average involved 15 people per product, 5 in the UK and 10 in Mumbai. An attempt was made to reduce the UK presence to 1 Mastek staff member per product. This was found to be highly problematic for the following reasons:-

- level of workload in Trowbridge

- the need for local government expertise and understanding of the language of taxation and benefits

- time and availability of key staff in Mumbai

- problems of retention of staff in Mumbai one factor of which is due to an unpopular Ingres platform used by Academy

5.4.2 Technology For Team Communication 1996 - 1998

When considering the use of technology, in order to communicate with Trowbridge and vice versa a 64 kbs leased line is in place which goes via the Mastek intranet to USA - to an Internet Service Provider (ISP) in USA to ISP in UK. The Mastek file server is outside the firewall so that Mastek staff in Trowbridge can log on and retrieve source codes via FTP /

TELNET. Staff use UNIX chat for synchronous discussion and telephone conferencing with a communications room at Mumbai and Trowbridge for group discussion.

5.4.3 Human Resource Development (HRD) Strategies at Mastek 1996 - 1998

The level of analysis of individual, project team and organisation level is affected by HRD and there is a comprehensive strategy for human resource (HR) development at Mastek. Human resource issues were not explicitly discussed in the theoretical framework but when the author had the opportunity of an interview with the HR director in Mastek during fieldwork in Mumbai, the importance of this function became apparent. Interviews with HR function staff enabled an improved understanding of the criteria by which staff are graded and assessed and contributed to an understanding of how success in the process of software development is measured. The HR function also had many contributions regarding structures which motivate, control and reward Mastek staff which has been of importance in considering the cultural and political dimensions of the study. The author also had repeat interviews with one of the HR staff who was interested in the work and commented on some of the draft submissions. As well as the description of the HR process given below, discussions with HR staff contributed to thoughts and analysis of self identity, trust and risk issues in particular.

The Mastek "strategic deployment process" is the planning and implementation process within which the organisational directors and senior managers decide upon the "thrust areas" for the company. Employee satisfaction is at a high level in Mastek. Employees, known as "Mastekeers" have a high level stated goal within Mastek which is to "facilitate each member to his or her full potential". There are 3 "cornerstones" of HR development

- performance management

- training and development

- career development

Performance management is concerned with the setting of KRA' s (key result areas) which are facilitated by 6 monthly appraisal cycles and objectives passed down into departmental, self development and supervisory KRA's. Training and development aims to identify weaknesses of staff members and then link work experiences with weaknesses to improve whilst on the job. Staff are given a rating at the end of a year which may lead to a performance related increment. This may be coupled with an award as a system of staff awards or prizes is in place linked to performance management. Training and development takes place at level of individual and strategic business unit. Mastek are attempting to look at training at the company level indicating the "core values" of the company and how that can be understood by the whole company. Career development provides a defined career path at Mastek from programmer to analyst, module leader, to project manager. Employees are encouraged to apply and move between assignments as far as possible within the constraints of their customers' needs. This is often problematic:

"Mastek staff need challenging work and if the platform is outdated for instance they feel the sense of obsolescence very quickly. The USA is a major draw for them"

HR staff visit the UK every few months to meet every Mastekeer face to face and subsequent contact is maintained via email. The future vision of HRD is for "every project manager to be an HR manager". This would give greater presence of the HR function when staff are working offshore.

5.5 Analysis: Issues and Relationships

The analysis in this section starts by examining the issues at the key level of analysis, that of project groups. It quickly came to the attention of the author that this level of analysis was key to the process and its complexity required an additional element to the theoretical framework thus providing a means of dividing the relationships between the various groups. In order to do this, stakeholder analysis (Mitroff 1983) was considered. As the work was proceeding, the author was reading other works which were considered of interest. Latour (1996) was useful in identifying groups of "actors", offering insight and considering the relationships and interests between the actors in the network of relationships and other levels of analysis. Interestingly, the consideration of "non human" stakeholders, a feature of actor network theory (Latour 1996), began to be of interest particularly when considering the inscribed interests within technology such as structured IS development methodology. This analysis of relationships was first presented to the management of Academy and Mastek at the 6 month point of the investigation and thus many themes are investigated in more detail in later sections. It is included here because it was used as a vehicle for discussion with Academy and Mastek staff once they had read the interim report (see Appendix). Exploring the relationships was important in drawing further useful lines of inquiry. As before, the term "onsite" refers to staff located in Trowbridge and "offshore" refers to staff in Mumbai.

5.5.1 Academy and Onsite Mastek Development Staff

The initial relationship was forged onshore at Academy offices in Trowbridge and it is this relationship which is most significant. There is a strong corporate culture in place at

Academy which reflects the culture of the aggressively competitive, acquisitive Capita holding company. Although Indian programmers and methods were instrumental in creating and sustaining the designs of Academy management regarding the work culture, it is in contrast to the style of work in the Indian context. This was indicated through interviews with Indian staff when discussing the "culture shock" experienced by Indian programmers entering into the UK national context possible for the first time. Mastek programmers and senior staff indicated a similar culture shock at entering into the intensely pressurised nature of work at Academy. This has at times lead to cases of "burn out" amongst onshore Mastek staff and for some time prior to the arrival of the present Academy project manager, a very high turnover of senior Mastek staff working onshore at Academy. Programmers reported that they feel more productive when onshore in Academy UK due to the adhoc work and problem solving. Work in the software factory in Mumbai is perceived by programming staff as dull and repetitive whereas work in the onshore context, although more pressured, is more rewarding and fulfilling.

Relationships between Mastek onsite and Academy staff were perceived by programming staff to be generally good although inevitably Mastek staff can feel insecure in their vendor-customer relationship and rather under threat of failing in performance expectations. An interview with a Mastek project manager indicated that there exist 3 categories of onsite Mastek staff:

"those who are "there for the money", those who see the period in the UK as being a launchpad to the USA and those who genuinely enjoy working in the UK for quality of life reasons. It is the latter group who tend to gain the greatest social acceptance." Sanjay, Project Manager at Mastek (Trowbridge)

5.5.2 Academy Management and Offshore Mastek Development Staff

At present the issue of attrition and retention of staff is of key concern in this relationship. There seem to be different perceptions in defining and dealing with the problem. Mastek Mumbai has in place mechanisms to lower the attrition rate (discussed in the HRD section) whilst Academy management view the problem as inevitable and puts the responsibility for attrition wholly with Mastek. A key issue contributing to the problem of attrition is the importance of an understanding of the context to development (UK taxation system etc.) which is essential to developing Academy products. Skills in the software sector can be developed in a relatively short space of time but expertise in Academy's market and to acquire the language of for example social security or taxation takes longer. Thus a long term commitment by programmers is desirable. This problem of attrition is accentuated by an unpopular development platform used at Academy.

At the organisation level of analysis, a key issue during the period concerned the current vendor / contract arrangement as Mastek became more closely intermeshed within Academy. As both sides attempt to understand their roles and responsibilities it was seen as important to critically examine alternative organisational forms for future work and the advantages and disadvantages they offer.

Interviews in Mumbai and in UK indicate that Indians do not see the form of employment in the software factory as offering them a long term career structure, they view it as "satisfying a process" with "poor job satisfaction and low creativity". This perception is reflected in the language used in both Mastek and Academy for instance the "software factory" suggests the

Fordist production line, the process is referred to as "people independent" "like clockwork" etc. which suggests that both Mastek and Academy view staff as a resource in a mechanistic process. There is also increased competition from lucrative contracts in the USA which contributes to attrition.

5.5.3 Offshore and Onsite Mastek Development Staff

In the early stages of the relationship, the outsourcing model was based around a broad "body shopping" type operation with Indian programmers based at Academy in Trowbridge. As Mastek advanced along the "trust curve", they were shown to be competent and capable in meeting Academy's management needs from a political perspective (discussed later) and in the quality and timeliness of the delivery of code. At this point there was a change in the nature of work with a number of additional Mastek staff brought to the UK and the moving of some work offshore. A key theme in this area concerns the onshore - offshore mix of Mastek staff and the relationship with Academy needs. At one point in time, the number of staff onshore was reduced to a minimum but this was seen to have negative results, discussed in overview in 5.4.1 above. There are significant cost reductions to be had in moving more staff offshore particularly as Academy products move towards a maintenance phase. However, the disadvantage of this strategy leaves Academy open to the high level of attrition in the Indian context. Mumbai attrition is at an extremely high level with some companies reporting attrition rates of 40%. Attrition levels are relatively low for staff working onsite as there are few companies in the locale and staff are on temporary work permits.

Another key area concerns the nature of work onsite and offshore. The Mastek methodology is perceived by senior Mastek staff as creating a "people proof" process thereby protecting

against the problems of attrition. This however leads to a division of labour where offshore staff experience repetitive and monotonous work contrasting with the greater intensity, variety of tasks and responsibilities in the onshore context. This has some bearing on the levels of attrition experienced.

The structural conditions underpinning the Mastek methodology do not allow for the offshore team to directly communicate with the client staff. This reflects the need to maintain trust across time and space and the need for a "cultural buffer" between the offshore and onsite staff and Academy staff.

There are mixed views amongst senior staff on whether a wholly offshore operation is feasible. There is a view held by some that the potential offered by such advanced communications technologies as video conferencing will lead to a greater proportion of the activities within the software development lifecycle being undertaken at Mumbai. Other perceptions indicated that this would offer too great a risk. It was felt that there is a need for physical presence in order for anything other than highly structured work.

5.6 Cultural Analysis 1995 - 1998

The analysis will now continue to an examination of cultural factors which were of relevance in the ongoing Mastek - Academy relationship. This is concerned with the period 1996 - 1998 when software was being developed using the time and materials approach and the team was split between Trowbridge and India. However, the period 1995 - 6 when all work was done onsite is of great interest with regard to cross cultural factors and the "reverse process" of globalisation which will be examined below.

context	socio structural	cross cultural issues	symbolic factors	sub cultural issues
India Context : Mumbai an overcrowded city in a developing country.	Autocratic leadership at Academy. The key personality of Peter Kelly.	Differing mode of communication. The impact of social niceties for example expressions of requests by Indians are perceived as abrasive orders or commands.	Architecture contrast in software factory.	Subcultures in the period 1995-6 (inception).
UK Context: Trowbridge, Academy and aggressive software house in a struggling location.	Profits, shareholder and customer satisfaction key measure of success at Academy.	No direct communication with home organisation.		
Capita: aggressive entrepreneurial.	People at strategic level in Mastek.	Differing attitude to deadlines / timescales.		
		The need for etiquette courses.		

Fig 5.7 Summary Of Cultural Analysis

5.6.1 Cultural Context

The environment in which Academy and Mastek sit is British and Indian respectively. This provides a contrast between respective living standards and infrastructure together with widely differing governmental structures and philosophies. Britain could be categorised as largely a Western capitalist society whereas India has until recently been driven by socialist policies which have failed to overcome the population burden and intense poverty in some areas. When the author visited Mastek Mumbai, the contrast of living standards is highly apparent. The offices are of a Western style with hi tech equipment, furnishings and air conditioning which contrasts with the polluted, generally run down, poverty ridden streets of Mumbai. This contrasts with Academy as an aggressive software house in a struggling location. Trowbridge is considered by Academy staff to be a town in decline with insufficient investment and infrastructure. India historically has no safety net of a social security system

and there is intense competition for the best schools and Universities, the Indian Institute of Technology (IIT's) being the most spectacularly oversubscribed.

Academy as a significant part of the acquisitive Capita group is extremely competitive and aggressive. Comprised of a series of product acquisitions, the company remains tightly controlled with an authoritarian style of management. The character of Peter Kelly is important as a key personality. Kelly himself is a bald headed, tough looking character who is conservative in his ideals and often uses colourful language. He is known for working people hard and his own punishing schedule (he commutes from Kent to Trowbridge each day) reflects his "lead by example" philosophy. Interestingly, he once referred to himself as being perceived as "a reactionary old sod" during an interview and on another occasion Kelly suddenly stopped talking and drew my attention to a ponytailed young man sat opposite outside his glass fronted office. "He will soon be removing that!", said Kelly.

A consistent attitude emerging in interviews was an "external focus" in Academy in that the priorities of the company are to satisfy shareholders and to make a profit which implies that staff are seen as a resource to be maximised. Mastek in Mumbai also operate in a competitive arena but as indicated in the HR policy, staffing is considered at the highest level in the organisation. However, coping with the inherent problems of attrition means that the "software factory" has similar shades of a Fordist orientation. The Mumbai based operation however is much more relaxed and informal than the pressured, frantic style of work onsite at Academy.

5.6.2 Cultural Analysis Period 1995 - 1996 "Inception of Outsourcing"

At the inception of outsourcing, the "bodyshopping" model was in place. It was at this stage in the relationship that there was a conflict between the *sub cultures* of the respective organisations which made up the embryonic Academy IS. The existence of these subgroups in particular the WWDC staff, who felt themselves to be influential, was a major factor in the inception of outsourcing. The MD of Academy was keen to "weld together" a coherent organisation:

"Let me tell you about an interesting sociological experiment........I ended up with a mix of people, a bunch of ex local govt people, a bunch of ex Sherwood people .....and some people from Dataflow. So I ended with three different sets of people from different walks of life with different views of life."

The WWDC software products were staffed by ex council programmers who came from a very informal culture which clashed with the desired disciplined culture:

"In the West Wilts side of the organisation there was a certain arrogance about the way you design systems and basically it was totally informal, there was no acknowledgement that project management, systems development methodology and standards were a good thing and so on." (Kelly, MD Academy)

The potential for use of Indian programmers and structured methods was seen by Academy management as a way of facilitating change, improving control, creating a corporate ethos and ensuring the long term survival of the organisation. The Indians are perceived by

Academy staff to be "more compliant, more traditionally skilled and less aggressive" than their UK counterparts. This cultural feature is recognised by the Mastek management team :

"Culturally India is not a very assertive culture - Indians tend to go along with what other people say - especially with authority figures. When coupled with geographical separation it becomes difficult, especially at Academy" (Mastek HR Officer, Mumbai)

"Most of our guys are submissive in attitude. I have been around a bit more. Most are shy to call a spade a spade" (Mastek Project Manager).

The "especially at Academy" refers to the aggressive, lean and efficient mode of working and authoritarian management style at Academy.

The author was sensitised to this issue of relations to authority by Hofstede (1980) who places India as a high "power distance" country relative to the UK, which is categorised as relatively low power distance. This work would indicate that deference to authority amongst Indians is greater than in the UK. By way of further analysis of this facet, Sahay and Walsham (1997) also identify that deference to authority is a feature of Indian society. Their framework which is based on Giddens's structuration theory avoids the cultural determinism of Hofstede and acknowledges the diversity amongst Indians and the role of individual agency. With regard to social structures, they view managers and developers as members of different social systems arising from both work and non-work related systems such as intellectual groups, local community and family. These systems have various rules and resources embedded within them which managers and developers draw upon to create agency which in turn can potentially either reinforce or change social structure. Often these rules and resources drawn

upon to form these systems are conflicting, for example the work norm of efficiency would clash with the family norm of helping a relative. There is thus constant tension and contradiction in the creation and articulation of agency. Norms of hierarchy often seen in family relations and the caste system are structural conditions that are often implicitly drawn upon implicitly or explicitly by many Indians in developing agency. Social relations are often seen to be hierarchical in India and people show status consciousness, finding it easier to work in superior-subordinate relationships that are personalised rather than with equals on contractual terms (Sinha 1988). The impact of this when staff work in the UK is shown by the opinion of a very experienced senior Mastek project manager based in the UK:

"In India, you mingle exclusively with people of your own social standing. In the UK that doesn't exist. Their (the Mastek Indian programmers) behaviour changes in the UK. They tend to chicken out even if they are authoritarian at home. They take shit from English people" (Project Manager, Mastek).

This facet of the status consciousness of some Indians is especially an issue in the context of work in UK because of the long and deep rooted effects of the history of British colonisation. According to Sahay and Walsham (1997) the caste system provides norms and values related to functionality, status and power.

With regard to religious systems, while a large proportion of Indians are Hindus the country supports a great many other religions as well. Sahay and Walsham (1997) cite Radhakrishnan (1993) who writes that a system of unifying beliefs can be found that has guided the lives of ordinary Indian families for generations. Even in modern India religion and attention to spiritual matters generally tends to play a more significant role in Indian day to day lives than

in the UK. There are a great many places of worship in India and pilgrimages still feature highly. On one of my visits to India on a trip to Rishikesh in Northern Uttar Pradesh, large numbers of pilgrims were walking hundreds of miles carrying brightly tinselled frames which would be taken to a temple in the Himalayas. Rishikesh itself is a pilgrimage destination and a holiday venue for many ordinary Indian people with bathing in the waters of the holy Ganges a highlight of a visit. In India, religion and religious symbolism are pervasive. Prayer rooms are usually in place in software companies and taxi and rickshaw drivers often display religious icons and lorries would have painted religious messages and quotations on the rear of their vehicles. Mastek staff informed me that they had a series of reading groups one of which was concerned with the work of the Indian philosopher Krishnamurty who deals with issues of the spiritual self. When relating this to events at Academy and the nature of functional characteristics in social behaviour, it is significant that Sahay and Walsham (1997) draw attention to the sense of duty which is sanctioned by the Bhagavad Gita:

'And to thy duty, even if it be humble, rather than another's, even if it be great. To die in one's duty is life: to live in another's is death'

Given the importance of religion for many Indians it is significant that Sahay and Walsham (1997) cite Saha (1992) who describes socialism in Indian government as being one aspect of the overall endeavour to preserve the Hindu social organisation. The Hindu virtue of contentment, absence of desire and stability opposes the dynamic striving for success and unlimited consumption that capitalist systems emphasise.

The highly aggressive competitive style of Academy may have added to a preference for accommodation rather than conflict within the Indian Mastek staff leading to a submissive

posture. The implication of this is that Indians could be relied upon to facilitate change at Academy.

Roland (1984) states that in Indian work relations the superior is seen to be "kind" and the subordinates "submissive". Sinha and Sinha (1990) make the point that in India work is often viewed as a duty to the family and failure in one's role would bring shame not just on oneself but on the family as well.

Sahay and Walsham (1997) describe the domestic system as a "dominant structure in the Indian context" and rules of conduct are firmly defined such as the eldest son is expected to take care of the parents when they are old. Paternal authority tends to dominate and govern social and organisational activity. For Academy, these cultural characteristics of the Indian developers were conducive to their aims:

"I could import a whole load of people who worked to methodology, project plans and were traditional in the way they worked. So they would sit there and wait for a product manager to bring a specification. If the product manager came over and chatted to them and then said "can you start now" they would say "no, not without a specification", he'd say "what's a specification?", they'd say "you've got to write down what you want" so he'd go off." (Kelly, MD Academy).

This instrumental use of systems development methodology embodied with the Mastek developers drawing on various Indian structural conditions will be further discussed in the following section on power issues. But before summarising the discussion on cultural issues,

another significant issue arose of pertinence to systems development which was a consistent theme from many interviewees:

"when presented with a piece of work and asked if they can meet the deadline the Indian's will always say "yes", even when it can't be done" (Product Manager, Academy).

This perception by Academy of the Indians' feeling a need to not say "no" is potentially related to the points discussed earlier concerning the need for accommodation but also a reflection of a sense of duty to the family and one's superiors. For those working onsite, it must be stressed that many Indians send money home when abroad so there is a financial consideration. A further point of relevance is that in common with many Asian cultures, Indians protect their own and others dignity in an effort to "save face" and admitting that one could not do what was required would be undignified. Interviews with Mastek HR staff indicated that this may lead to a reluctance to question, confront or risk making mistakes or bring bad news (e.g. project management delays). Indians tend not to *publicly* correct others even if they feel they may be wrong. Sahay and Walsham (1997) point out that Indian domestic family socialisation contrasts with the western which values independence, speaking out, direct communication and relatively unrestrained expression of anger and resentment.

The "traditional skilling" of Indian's which was of interest to Academy reflects the emphasis on discipline in Indian schools with traditional structured learning approaches and where mathematical - skills form a large proportion of the curriculum. Indians tend to be mathematically adept and disciplined in their thinking. In my own experience of teaching MBA students at the Indian Institute of Management, Bangalore status differential between students and lecturers seemed considerably greater than in the UK. For a visiting faculty

member, the act of inviting students for drinks and a meal in town was quite unusual for them and it seemed a unique experience for them to light up a cigarette with me. Also it is worthy of note that the Indian software industry is a major draw for young Indians as it is white collar, well paid and offers the chance for travel and work abroad perhaps to the coveted California. Interviews with IIM Bangalore students in 1998 indicated their perception that there are fewer career choices in India relative to the USA and thus the quality of staff entering computing and software related careers is high.

5.6.3 Cultural Analysis Period 1996 - 1998 Offshore And Onsite Operations

After the period of inception of outsourcing, the relationship between Mastek and Academy was seen to move up the "trust curve" to the point when operations moved to a time and materials basis and a proportion of staff moved onshore.

With regard to Mastek onsite and offshore team communication, it is significant that no direct communication between the Mumbai based team and the client is ever allowed to take place. Interviews revealed this to be due to a number of factors: cross cultural issues, time and context. The time and context issues will be dealt with later, but of interest to cultural issues is the differing "mode of communication". Everyday Indian speech contrasts with English everyday language.

"The differences in social culture of the mode of everyday conversation is seen as different. One consistent problem is the impact of social niceties for example expressions of requests by Indians are perceived as abrasive orders or commands." (UK Factory manager Mumbai).

191

Thus, when certain Indians converse verbally (or via video conferencing) with UK based clients their turn of phrase can be misinterpreted as aggressive and blunt to the point of rudeness. According to several interviewees, a period of residence in the UK allows for this to be alleviated but this example of the phrasing of requests as orders is significant in cross cultural communication. One interviewee (UK Factory manager, Mumbai) when asked gave an example:

"Let's say I wanted you to do something for me. If we were in India I might say "Brian, please do this for me" (said in a strict manner) whereas in the UK or USA there would be more niceties, more attempt at persuasion".

Onsite Indian staff are required to attend so called "etiquette courses" before travelling to work at the client site. This is a two day course which draws attention to these "social niceties", but also covers social conventions such as dating and relations with the opposite sex, going to the pub, dress etc. My own experience of working in Bangalore during Summer 1998 did reflect this in that sometimes Indian's requests could be perceived as orders. One begins to accepts this as the norm when residing in the culture but it is recognised as a potential problem for someone who has never visited the country and is living a different culture.

Another issue of significance was the differential in status between the onsite and offshore team. In interviews with senior Mastek staff, (although not with programmers) it was revealed that there is a negative perception of the offshore staff by the onsite. There is a differential in pay, the complexity and sophistication of work between onsite and offshore. This leads to the offshore staff being referred to as "desi" programmers, a derogatory term. At

one meeting I attended, the directors of both companies were discussing this problem and attempting to address the status differential by "buddying", a term derived from the team approach to skin diving. The buddying of two or more onsite and offshore team members would encourage closer relations. The incorporation of higher bandwidth communications technology such as video conferencing was considered to be of value in this respect. The companies were also considering extension of company resources for personal communication with the "buddy" on family issues, India gossip etc.

Interviews with Dr. Abhoy Ojha, faculty member in Organisational Behaviour at Indian Institute of Management (IIM) Bangalore indicated that Indian's are sociable, gossipy by nature and feel the need to regularly converse and be together. Clearly Indians can demonstrate their agency and not all Indians display this cultural facet. However, in the authors experience structural conditions in India make one rapidly feel accustomed to closeness and intimacy with others. The city areas of the country are vastly overcrowded (the total population of India has crossed 1 billion) with an overstrained transport infrastructure. Travel by car or bus along the potholed, packed, chaotic roads is a strange experience for foreigners used to motorways. I have travelled for many hundreds of miles throughout Northern and Southern India and the incidence of "road rage" and aggression under these stressful circumstances has always struck me as suprisingly non existent. The need to engage with people is important when travelling. Unless one knows an area well one would have to interact with local people to find the way to your destination. Sahay and Walsham (1997) point out an Indian ambivalence to maps so one has to ask for directions. When in Bangalore I had a map which I would show to rickshaw drivers as a visual aid to communication which I thought they related to – I was often frustrated when we got lost! The closeness between Indian people is also of significance, for instance men are seen to hold hands in the street as a

sign of brotherliness, an affectation which would be frowned upon in the UK. Hofstede

(1991) makes the point that India is a collectivist country as opposed to the individualism of

the UK. This indicates a propensity for group behaviour, success of the group taking priority

over the individual. This contrasts with the aggressive individualism endemic in UK society.

5.7 Political Analysis

The following analysis is the result of the consideration of events and interpretations using the

analysis of power issues as discussed in chapter three. Fig 5.8 below provides a summary of

the issues and themes which were identified.

control of technology	control of counter-organisations	use of structure, rules and regulations	cross cultural issues	context	control of knowledge and information
Academy used control of technology (outsourced Indian programmers and formal lifecycle) to formalise the organisation and facilitate change.	Indian outsourcing used to coerce / dominate home organisation and remove West Wilts staff.	Methodology used to iron out diversity and make the work "people independent".	Indian cultural characteristics used in an instrumental way, disciplined, compliant.	Local Mumbai context used instrumentally for Academy management.	Specifications and formalism allows increased central knowledge of activities.

Table 5.8 Political Issues 1995 - 1998

5.7.1 Political Analysis 1995 -1996 "Inception Of Outsourcing"

The political dimension of this case study is of particular interest when considering the period

at the inception of outsourcing i.e. before the projects went to an offshore method of working.

In particular, the use of a structured information systems and project management methodology were used as instruments of power in creating an organisational reality in accordance with the wishes of Academy management. The Mastek systems development methodology is structured, formalised and allowed an extension of the control held by Kelly. By using this methodology, Kelly effectively ousted the WWDC programmers who were perceived as a *counterorganisation* because of their relaxed, undisciplined style of working.

" now we have got a rock of discipline right in the middle of the organisation, so unless you've got the specification in here you won't get the code out here. Unless you put a test plan in you won't get anything out etc." (Peter Kelly, MD Academy).

The "rock of discipline" referred to comprised of the Indian programmers together with their structured methods of analysis and design and project management. The perceived deference to authority characteristic of Indians mentioned in the previous section allowed Kelly to manipulate the process of software development and effectively make the position untenable for the WWDC staff until they resigned en masses (some without jobs to go to).

"The WWDC staff didn't think we would but we rolled the Mastek methods into housing" (Peter Kelly, MD Academy)

The bureaucratic approach has filtered into the rest of the company:

"So that has meant that all the rest of the organisation has had to bend to the methodology and work this way and that's how it works now. Even people who wouldn't do it in the past now subscribe to it" (Peter Kelly, MD Academy).

This rigid structured approach encapsulated by structured methods of analysis and design is reminiscent of the "mechanistic" organisation portrayed by Morgan (1986). Software development and management is seen as a machine like process, the programmers deskilled, replaceable parts. Importantly the Mastek staff at Academy were trained to "work to specification" which inevitably enabled greater control for Academy management. This view was reinforced by language used in interviews which included references to Tayloristic organisations such as "Burger King" as representing a pinnacle of service organisation.

Much has been written about the limitations of structured methods of analysis and design but little has been written about their potential for surveillance and coercion. Morgan's classification of power identified in the theoretical framework refers to "control of technology", Winner (1977) defines technology as artefacts, techniques and methods of organisation, these technologies contain assumptions and can be used to further the interests of those controlling it. Actor network theory (Latour 1996) usefully considers technology as a "non human" stakeholder which often contain assumptions or inscribed interests of the developers which could be to the detriment or benefit of parties in a power play. In this case we see the use of technology for instrumental coercion.

"By getting this formal lump of formal process in the centre of the company it has spun out and I can safely say now that everyone here subscribes to the idea of how systems are developed here" (Peter Kelly, MD Academy).

It is worthwhile examining how structured methods were used in this case to facilitate change. As discussed earlier, Mastek brought the ISO9001 accredited Mastek Quality Methodology

into Academy, a structured development and project management approach which is similar to the traditional systems analysis lifecycle. The approach has products, deliverables and forms in keeping with approaches such as Structured Systems Analysis Design Methodology (SSADM) (Downs et al 1992). Wastell (1996) argues that structured methodologies reflect a metaphor of the development process as a rational technical process embodying a rational engineering approach to system development. Baskerville et al (1992) make the point that structured methods for IS development are based on the scientific and thereby reductionist paradigm. In this way methodologies facilitate a control dimension by providing a coherent framework within which walkthrough techniques, audit procedures, quality control and inspection procedures can be incorporated" (Ahituv et al 1984). In this case the mechanisation, division of labour and deskilling of the process was objectionable to the counterorganisation of the WWDC programmers. The bureaucracy and rule bound nature of the approach increases the control that management has over the process. The documentation is transparent to surveillance and Academy management could rely absolutely on the Indian programmers conforming to the prescribed procedures. Thus the methodology facilitates a division of labour and systematisation of knowledge allowing knowledge to be stored, systematised, disseminated and exchanged. In an organisation like Academy where the main "product" is software, the Mastek structured methodology signified a move away from informal methods of development described as "the back of a fag packet" towards the Fordist production line approach.

Methodologies of this nature promote discipline among developers by specifying a structure for the development process and thus the transparency of work to surveillance. During field interviews at Academy, Peter Kelly gleefully showed the presentation of a Microsoft project bar chart showing exactly where staff were up to with particular projects. The various client

reports in "Guidelines to Project Status Reporting" section of the Mastek IS development methodology shows the potential for surveillance over the process of software development.

Thus, when the structured methods were "embodied" by the Indian programmers, the process of software production became formalised and open to surveillance. The use of embodied methodology in this way conjures up the image of the Mastek Indian programmers representing pawns on a chess board in a battle between WWDC and Academy management for control over the organisational culture and methods of working.

Interviews with the Indian programmers who were present during this period reveal the complex association of power which fell into place for Academy management. Firstly the characteristic of the Indian deference to authority and sense of duty was of significance as discussed above in section 5.6. Also of significance was the cost of failure. The Indian programmers were not however in Garfinkel's (1967) terms "cultural dopes" conforming mindlessly to structural factors and clearly not all Indians are the same. Any Indian programmer could have demonstrated their agency and left Academy or a sufficient number of complaints may have altered certain structural conditions. It is significant that there was a disproportionately high turnover of Mastek project managers at the commencement of outsourcing at the Academy site. However, the overwhelming impression given by Academy management was that should any programmer not come up to expectations or express dissent they would be sent back to Mumbai. Interviews revealed that some Mastek programmers felt uncomfortable about the treatment of WWDC programmers. It is significant that he or she could quickly expect to be removed from the contract and possibly returned to Mumbai if complaints were made. This could potentially terminate a lucrative stint in the UK and also may lower their opportunities of finding more attractive alternative placements in the UK.

5.7.2 Political Analysis 1996 - 98 Offshore And Onsite Operations

As the relationship has matured, Academy have begun to have greater reliance on Mastek as they move up the "trust curve". Mastek operations using the "onshore offshore split" now accounts for all of the development work done in Academy. This means that there has had to be a softening of attitudes and increase in trust. The relationship though is still fragile and subject to power play. Academy will sometimes agree to interviews with other outsourcing companies (Mastech, a rival of Mastek were invited in to Academy shortly before one of my interviews).

However, on smoking a cigarette in the street with the senior project manager from Mastek in November 1997, it became obvious that the power is not all one sided:

"Mastek could bring Academy to its knees quite easily" (Mastek Project Manager).

This project manager was indicating that the Mastek staff now were wholly responsible for development at Academy and held all the knowledge of the software. Thus, by the very fact that their knowledge of the system exceeds that of permanent Academy staff they have become extremely difficult to replace. Academy have a high level of dependency on Mastek. This is only countered by the size of the Academy contract. Still, the project manager's capability to withdraw labour and increase prices is significant and is a political position which Academy became increasingly uncomfortable with.

With regard to the use of formalised methodology, problems have arisen and gradually Academy are finding that formalised methodologies are oriented towards large scale development with a long development time. Continuous change that organisations are faced with means that short term needs dominate (Fitzgerald 1996). The investigation into the use of Rapid Application Development type development methodology is pending at Mastek.

At the level of analysis of the Academy group company, in July 1998 Capita signed an overall agreement with Mastek which is seen as offering a powerful political lever to obtaining quality staff and service from Mastek via control of resources. At the level of the firm, Academy have continued a "policy of acquisition" of new companies with complementary software products. Mastek have been used in an instrumental way to overcome staff resistance to change. For instance, the acquisition of a Manchester based software house in August 1998 has led to similar treatment to the WWDC case described earlier. During the final interviews in December 1998, Academy were considering new organisational forms which would reduce the reliance on Mastek. Fig 5.9 shows the new proposed configuration:
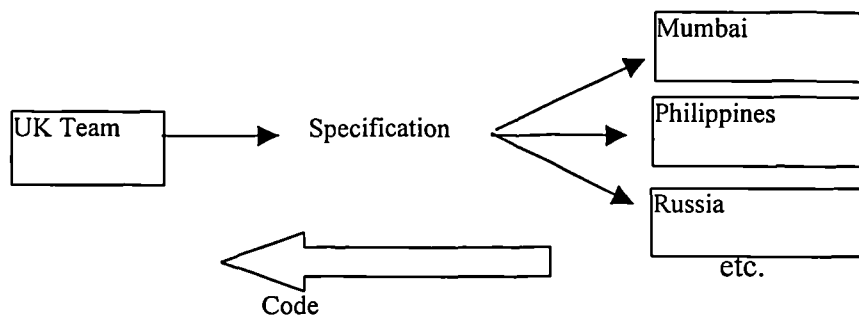
1
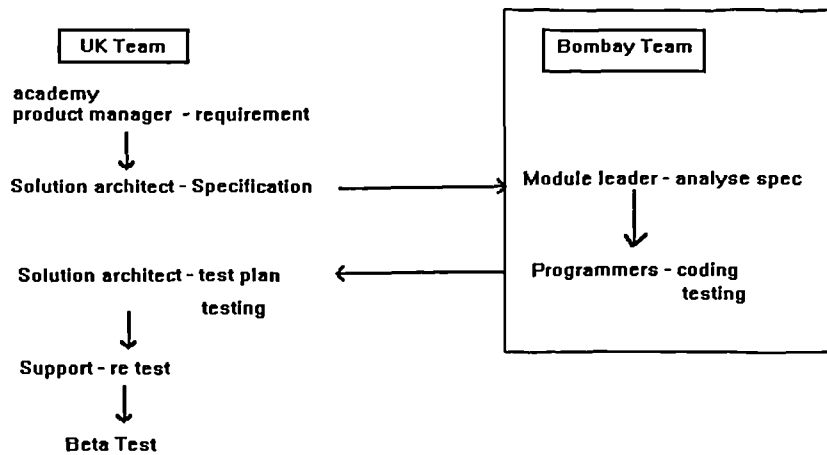
2

Fig 5.9 Diagram Showing Existing Project Group Structure (1)And Planned Multi Vendor "Switching"Capability (2)

The new project organisational form at Academy would enable multi contractor capability and the ability to exploit the global software marketplace thereby keeping costs to a minimum. The view expressed by Academy management was that this strategy would reduce reliance on Mastek by changing to this project organisation thereby avoiding over reliance and resultant price increases. Mastek's perspective was that there are disadvantages for this strategy in that considerable local knowledge is needed of the systems and so specifications would have to be very detailed, a time consuming process. Also their supplier loyalty and prioritisation of resources would potentially be brought into question.

In December 1998 Mastek themselves suggested a new development methodology which could potentially speed up development times. Referring to Fig 5.9, diagram 1 would remain the same only specifications would be made more brief with a resultant increase in coding errors obviated by a strengthening of the error checking facility in the UK team. Mastek's perspective on this is that it would tie Academy in closer to Mastek due to the need for more specialist offshore knowledge. It would also enrich the work offshore potentially relieving some of the pressures of attrition. Video conferencing trials may also have some impact on the project group relationships but this remains to be seen.

The analysis up to now has shown that this case study demonstrates the potential for instrumental use of cultural characteristics and development methodology in order to subjugate an employee group. The additional dimensions of time and space have offered Academy global potential for task completion and there are significant issues to be considered with regard to the issues of managerial power. The dark side of the implications of this case study lie in the danger of a new managerialism with the potential for subjugation of employees in a global arena and the capacity to switch suppliers easily and without notice.

5.8 Globalising Tendencies

It is now appropriate to examine the case study through a consideration of globalising tendencies as indicated in the later writings of the sociologist Anthony Giddens which was described in chapter 4. The case study has produced some interesting insights with regard to the condition of globalisation of software development. The discussion will firstly analyse the significance of globalisation and then proceed to examine the case study through the theoretical lenses of Giddens (1990, 1991).

It is important first and foremost to consider the aspects of globalisation manifested in this case study. The course of events at the outset of outsourcing represents an interesting dimension to the traditional understanding of the processes of globalisation and it could be argued indicates a *reverse process of globalisation.*

The literature on globalisation as reviewed in chapter 2 is critical of the effects of Western culture and management methods into other cultures which is intensified by mass telecommunications. This view is exemplified by the work of Ritzer (1995) who identifies a burgeoning "McDonaldisation" of society, the McDonaldisation thesis essentially rests on a critique of the societal impact of the systematic, dehumanising "burger bar" management methods which have many features in common with F.W. Taylor's scientific management. This case study shows that these warnings are to some extent founded. Other authors are critical of the exploitation of developing countries for cheaper labour costs and the ease of shifting production facilities overseas which is a particular feature of software production. Warnings of a new managerialism in "electronic sweatshops" (Attewell 1987) accompany examples of Western corporations exploiting developing countries sometimes involving horrific working conditions and poor attention to health and safety. Although working conditions in the Indian software factory would not constitute sweatshop conditions based on the example of Hong Kong textiles, the mechanisation of work and lack of job satisfaction on the Fordist software production line is characteristic of a mechanistic approach. The case shows a realisation of Attewell's warning of intellectual assembly lines, certainly the deskilling of work characteristic of scientific management is in evidence.

Lyon's (1990) critique of Bell's (1974) utopian stance of knowledge work in the information society is reinforced by this case study. Far from offering empowerment and liberation, in this case the "information elite" or "knowledge workers" who Bell believed to be empowered by the information society are subjugated and used instrumentally as a source of labour for the intellectual assembly line.

Another stream of critique concerns the effect of mass media forming a "cultural colonialism" (Martin 1995). However, this case demonstrates that as Giddens states, the cultures are "reciprocally influenced". In this case, the Indian software analysts were trained in what could be described as a Western management method, the rigorous ISO 9001 accredited software quality development process. This methodology and the compliant, systematic adherence to it was imported back into the UK from India as a mechanism for coercion of the UK based employee. In this case, the impact of globalisation has not been to import Western management methods into a remote context, but in a more sophisticated way to exploit the cultural differences between the countries in order to achieve a satisfactory power arrangement in the West, a reverse process of globalisation.

At this juncture, it is useful to reflect on Giddens's writings with regard to the impact of the global and the local. Giddens give the example of a local neighbourhood which is likely to be influenced by factors - such as world money and commodity markets. He also gives the example of how increasing prosperity of an urban area in Singapore might be causally linked to the impoverishment of a neighbourhood in Pittsburgh whose local products are uncompetitive. Thus, global structures shape local events. However, Giddens does not consider the possibility of the opposite effect of globalisation, that of local events shaping global structures which, it is argued, this case demonstrates. Local events (in India) are in

effect shaping global structures regarding the various potential offered by GSO. Local events in India include examples such as trends in platform popularity, competing skills and the potential for Indian labour to asset strip organisations in the way described in this case. The scenario painted by Mowshowitz (1994) of the "switching" between suppliers like the switching of the virtual memory of a computer represents a nightmare vision of this eventuality.

The discussion will now move to considering the case through the theoretical lenses of the later writings of Anthony Giddens concerning the key dimensions of globalisation: time and space, disembedding, trust, risk and identity.

5.8.1 Time and Space

Overall, the impact of globalisation has simply offered Academy more options with regard to the time and place of its software development and to a depersonalisation and commodification of human labour:

"I don't care who does this work, it could be Peter Kelly, it could be someone in India or it could be you - I simply don't care, I just want it done" (Craig, product manager at Academy).

The impact of the additional dimensions of time and space on the process of software development are significant in offering this flexibility. With specific relevance to Giddens, let us now turn to the dimensions of time and space manifested within this case study. Firstly, the issue of "time lag" is significant. There is a (GMT +5.30) five hours and thirty minutes difference between the UK and India and thus for a large part of the day offshore and onsite

programmers and analysts cannot talk to their counterparts instantly. Teams have to wait until the work times correspond. Thus for Indian based staff, in the peak of the day they cannot communicate with their UK counterparts and in the afternoon the UK is left alone after the Indian team finishes for the day. The problem is more significant for the Indian based team:

"Problems which are fresh in the mind need to be sorted out and that does not happen at that time. A number of items and many things can happen...cannot work things out." (Factory Manager, Mumbai).

This freshness in the mind is crucial in the nature of problem solving at Academy / Mastek and it means that a programmer will have to store several problematic areas for discussion with the UK based counterpart when they come "on line" in the Indian afternoon.

This is a cause of anxiety and stress both for project teams and customers. However, Mastek will attempt to conceal the threats inside the "black box" of the software development process. This conceals from the customer the various interrelated systems that their software development will exist within (see section on *Risk* below)

A second major facet of software development across time and space concerns differences in expectations. The sentiments of a Mumbai factory manager sum up the problems:

"India has relatively more vacations and public holidays than the UK and USA. People (in India) are not geared up to doing their job first other things later, in USA for instance there is a different priority, work comes first." (Factory Manager, Mumbai).

By way of explanation for this, Sahay and Walsham (1997) stress the importance of family in Indian society. Hofstede (1980) makes the point that UK and USA are more aggressively individualistic than Indians which could contribute to account for this difference in attitude to work.

In a country where no social security system exists, family support networks are the only safety net which exists and this is one reason why the family unit is strong. Work is perceived as highly significant but family responsibility has a higher relative priority than UK. Other possible explanations could be that UK and USA are largely secular societies and religious institutions are of lower significance than in India. This accounts for the large number of holidays and religious festivals.

This point was reinforced in interviews with other senior Mumbai staff concerning attitudes to time and deadlines:

"In India if a deadline is approaching and if one knows that it will not be met then typically an extension will be requested. In the USA missing a deadline is a very serious offence" (Factory Manager, Mumbai).

Sahay (1998) points out the failings in Indian project management with regard to geographical information systems implementation. Saha (1990) writes "perhaps no sphere of Indian economic activity reflects the impact of traditional apathy towards time and mental orientations towards it more vividly than the impact of project type of assignments". Sahay and Walsham (1997) discuss the differing attitudes towards time in India. The origins of this

differing attitude are not well understood, it is perhaps due to the climate and religion as the Hindu belief in reincarnation means that one has limitless time. Hofstede (1980) places India as a low "uncertainty avoidance" country meaning that generally people are comfortable with facing the future at relative ease. Sahay (1998) points out that classical Indian literature shows a contemptuous rejection of common-sense time and little attempt was made by scholars in pre modern India to quantify duration and chronology. Saha states that Indian managers tend easily to accept uncertainty, to under value time and to take each day as it comes. (Saha 1990; De Riencourt 1960, Singh 1990 cited in Sahay and Walsham 1997). Sahay (1998) points out that the rational project management approach used in the West contrasts with the culture of Indian government projects where delays are the rule rather than the exception and accountability does not go further than the writing of official memos. The implication is that misunderstandings and differing attitudes to time can sometimes have disastrous consequences for cross cultural IS project management across time and space.

5.8.2 Disembedding Mechanisms

The second area dealt with by Giddens is concerned with the effects of the disembedding of social relations. Giddens discusses the state of globalisation as being characterised by social relations which are disembedded from "absent others". This is significant in this case study as Mumbai is prone to power cuts and technological communication failures unheard of in the West. When power failures take place, the Western client has no understanding of the local context and this lack of understanding was reported by interviewees as sometimes leading to clients suspecting a mischievous excuse for lack of progress or to cover up a failed deadline. Thus, Mastek allows no direct communication to take place between the client and the

offshore team, encouraging the client to treat the process as a "black box". One reason given for this is so called "mental framework" of Indians and non Indians:

"(in the event of a failure e.g. of telecommunications)... the mental framework in place in another Indian guy allows him to appreciate that one is telling the truth. People in UK / USA cannot envisage the difficulties, another Indian recognises the problems as genuine..... the onsite team acts as an interpreter to maintain trust and confidence......" (Factory manager, Mumbai).

The ideas of a shared mental framework is associated with a shared understanding of the context within which work is taking place. This is crucial to achieving a sense of trust in the absent others located many thousands of miles away.

Giddens writes extensively on the notion of trust and risk in high modernity. The need for trust with absent others situated across time and space is a feature of the relationship between Mastek and Academy. The need for this empathy is exemplified when considering the delivery of code:

"if one file is missing, it leaves a bad taste, the Indian counterpart must upload and preliminary test as a first line of defence in building trust and confidence."

Thus, the first line of defence is by the treatment of the process as a black box thereby isolating the client from the disembedded events as far as is possible. The effect of disembedding of social relations is also significant with regard to Academy's local context.

Academy's product portfolio is a good example of applications which require a significant level of knowledge of the local context at the client site:

"(it is) ...important to understand the cultural context where software will be implemented, it is not like building device drivers which could be done anywhere in the world. This is why a substantial amount of work takes place at the site of Academy and their customers." (Mastek Director).

and thus staff are required to travel to the UK to familiarise with the local context even if they will never be working long term at the client premises.

5.8.3 Trust and Risk

The following themes within the dimensions of trust and risk were of interest in this case. The "intimacy of relations" between Academy and Mastek as they moved up the "trust curve" is significant. Mechanisms for ensuring trust such as surveillance were significant as were the attempts at mechanisation and the "people independence " of work through a division of labour. The final dimension concerned the theme of "cultural translation" in that Mastek arrange work so as to ensure that no direct contact takes place between offshore teams and client.

As well as trust, Giddens relates the key importance of risk in high modernity. As the Mastek software development process is marketed as a "black box", Academy are largely unaware of the risks that they are encountering within the various overlapping systems when entering into the global arena.
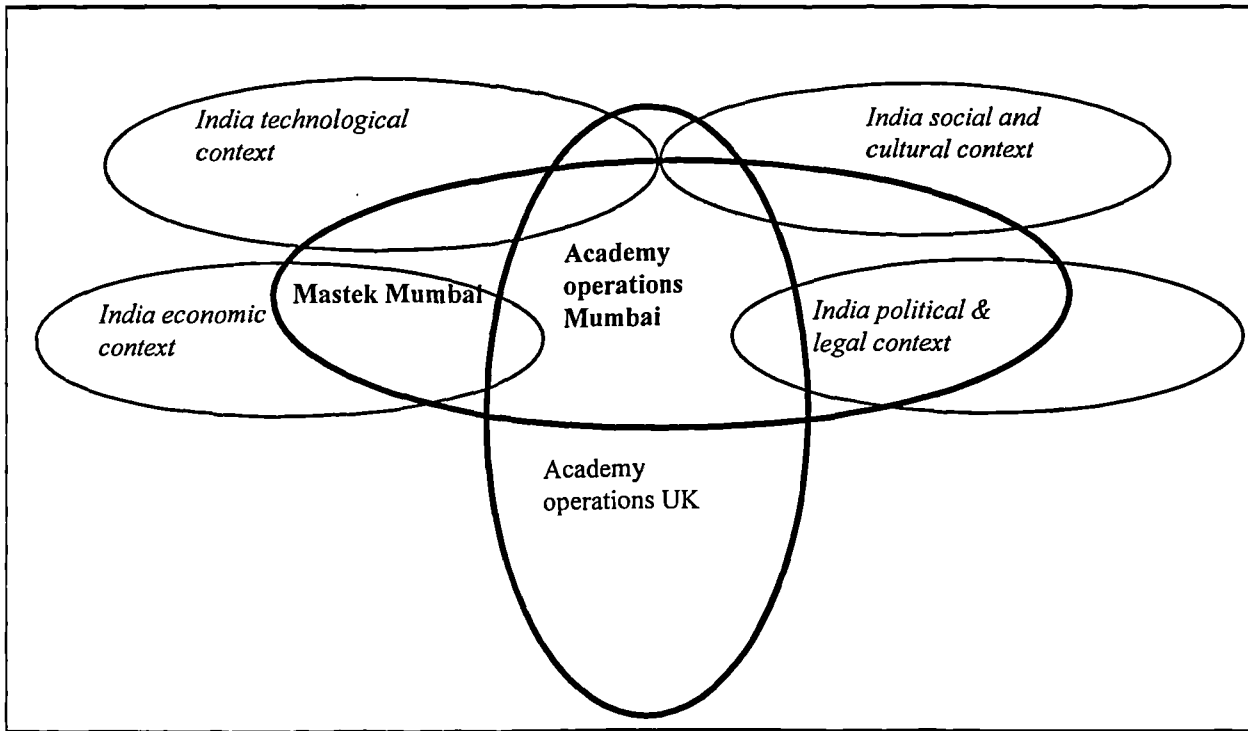
Fig 5.10 Academy's Risks of Globalising Software Development

Whittington (1992) usefully characterises these various overlapping systems as a feature in

the use of structuration theory. The inherent risk of modernity is apparent in the entry of

Academy into a global arena of overlapping systems. By outsourcing to India, Academy

expose themselves to the India political and legal context. The risks of economic context

were exemplified by the 1998 Asian financial crisis and difficulties over staff attrition in

Mumbai which can be as high as 40%. The social and cultural context has already been

examined to some extent but there are also other issues such as bribery and corruption which

are endemic in Indian society. The technological context exposes Academy to issues of

platform popularity and the global market forces affecting other countries which can affect

Academy's ability to attract the best staff. The technological context blends with the political

when examining the surrounding infrastructure and political plans for enhancement. And the

legal blends with the political when considering laws over intellectual property and the threat

of software being taken and marketed elsewhere. The political context also affects the education system with regard to the skills taught in the colleges and Universities. The impact of MNC's is significant. An example of which is Chandrababu Naidu's (Chief Minister of Andhra Pradesh) promise to Microsoft's Bill Gates of a curriculum change within Hyderabad computer courses to Microsoft relevant skills in order for a development site to be opened in Andhra Pradesh. The high level risk context concerns the general stability of country which at the time of writing was unclear given poor relations with Pakistan over Kashmir and the 1998 explosions of nuclear weaponry.

In the UK, the involvement of Mastek has led directly to a change in the Academy culture (at least as far as software development function is concerned) based around a formalised, disciplined approach. Along with this change in the nature of work has evolved a closer trusting partnership.

"Our staff in some instances have penetrated into very sophisticated development tasks and a considerable shift up the value chain with Mastek taking control of project management and product development. There is no equity sharing but the relationship differs from traditional contracting because of the "off shore mix" of personnel assigned to Mastek and the level of dependence and trust involved." (Factory Manager, Mumbai).

Mastek have gradually built up their intimacy with Academy as they have become more involved in the business through to taking the whole of the development. This reflects Mastek's strategy:

"The customer becomes intimate and sees we are interested in their problems and sorting them out. This is the relationship building model. Our objective is to build relationships. No desire to enlarge customer base but to expand into fewer customers businesses - penetrate deeper into fewer customers" (USA Factory manager, Mastek Mumbai).

In this case of absent software developers across time and space , issues of trust and risk could be seen to be tied up with mechanisms for assurance. One such mechanism comes in the form of surveillance information on what the offshore team is doing. This takes the form of timesheets and in some cases videotapes of staff working. Another assurance mechanism is by the deskilling of the development process by the use of structured development methodology.

At Academy, Mastek in mid 1998 had gradually moved up the trust curve and was involved in some strategic issues. For example Academy have an objective to market their products to bigger clients so to move from a system which can cater for 20 users up to 200 users. This means that Mastek have to be involved in decisions over response times etc. So Mastek are in the position of needing to be consulted over some strategic issues but this does not go as far as a need to discuss moves into a new field of business for example.

Overall, trust across time and space is problematic in the circumstances of outsourcing. Academy's outsourcing to India is tied closely with financial and political designs and their trust of Mastek evolves from the size of the contract they have with them and the ability to withhold payment (see 5.7.2).

5.8.4 Issues of Identity

Issues of identity and professional identity came to the fore particularly during interviews with Human Resource (HR) staff and Mastek programmers. Giddens's ideas around globalisation and the "reflexive project of the self" were of relevance when considering the professional and personal identity between onshore and offshore contexts. One facet of this is the need for cultural interpreter in the face of no direct contact between India based staff and the client. Persona and role was also of relevance when considering an Indian national working abroad and across time and space.

In this case study, Mastek expressed the view that by mechanising the work of offshore staff with structured methods and not allowing direct client contact with offshore workers, clients will be insulated from the offshore context. The separation of offshore workforce from day to day contact with client maintains cultural stability. The onshore counterpart acts as cultural buffer. This raises the question of the professional identity of offshore programmers, what is it to be a programmer, systems analyst, solution architect, project leader etc. Interviews with programmers indicated that there are more problems culturally for the people who are located at the client site than those "insulated" at Mumbai. The plush hi tech office space in Mastek Mumbai contrasts with nearby run down buildings and slum areas. Entry into an environment with an emphasis on skills for foreign absent customers provides very little job satisfaction for India based programmers. The mundane nature of work in the software factory could be likened to the Fordist production line. Inevitably, previous studies demonstrate that this production line approach leads to lack of motivation and a feeling of personal meaninglessness (Mumford 1983).

With regard to the UK based staff, the perceived importance of the onshore team provides recognition of the need to insulate the Mumbai based team and provide a buffer for relations with the client. This does however lead to problems of existential anxiety for the team at the client site who are likely to suffer from problems associated with persona and role. Firstly they are distant from home and many software engineers come from small towns thereby finding communication difficult. Interviews with programmers indicate that when on client sites, many programmers tend to socialise together. Conversely, some programmers feel it to be politically advantageous to adopt a Western accent and even put down their own country with derogatory statements. This indicates a deeper feeling over identity:

"There is pride of engineering culture but at the deepest level a basic sense of inferiority linked to the past and skin colour. In attempts to balance that , rather than interacting with the local environment, Indians tend to cook their own food, interact with own people, see Hindi movies, talk Hindi.....a lot of moralistic stuff comes across about tradition, we get married properly etc." (Human Resource officer, Mumbai).

To counter problems over identity, Mastek engages in "Etiquette training" for all contractors bound for client sites outside India. These courses are designed to enable workers to speak English so as to get their meaning across. This involves overcoming perceived problems with Indian accents. The training attempts to have more ambitious aims though:

"It also attempts to get across what is good about yourself and your country and be open to what the other culture has to offer and not denounce it - people do not alter their mindsets - they do not change their receptivity to newness."

The course tries to go beyond the simple matching of colours and dress:

"It (the course) tries to get to the "OK ness" within. Often Indians go with a feeling of "I'm not OK", which spills into a whole lot of stuff which happens at work" (Human Resource officer, Mastek Mumbai).

For India based Mastek programmers, the personal meaninglessness of work in the software factory is shown in an attitude to the work as being viewed as:

"a process rather than a career , there is low creativity, and it is repetitive" (Mumbai based programmer).

Outsourcing of software development across time and space in this case leads to the mechanisation of work and a division of labour. Also on a day to day basis Indian programmers are faced with working in a western style office, although still living in a developing country. They are working for far distant clients and having to work within their routines, methodologies and time frames. It is as yet unclear what the implication of this fragmentation and breaking down of rhythmicity will be. Castells (1996 p445) discusses "social arrhythmia" and uses examples of how technology has been used to alter the human body procreative capability thereby altering natural evolutionary lifecycles. For Castells, the network society is characterised by the breaking down of rhythmicity and natural lifecycles. The natural lifecycles, seasons, conventions of place and locale represented the time rhythm by which our species has been regulated since its origins. The social arrhythmia experienced by Indian developers constitutes a fundamental change.

## 5.9 Summary and Recommendations For Change To The Framework Of Ideas

This chapter describes and analyses the case study of software development between Academy and Mastek. The chapter opened with a description of the context to the two organisations and moved to examining the events in the outsourcing relationship from 1995 to the end of the research study period in December 1998. The political and cultural analysis was broken into periods of time from the "inception of outsourcing" through to the period of offshore development. The political and cultural analysis is followed by analysis of the globalising tendencies demonstrated in the case mainly using Giddens's writings (1990, 1991).

The theoretical framework was revised during the fieldwork with the addition of the identification of relationships between stakeholders within levels of analysis. This proved helpful in identifying themes and issues in particularly complex areas such as the level of analysis associated with project teams. Fig 5.11 shows how the framework, methodology and analysis approach were blended.

In practice, the framework of ideas and research questions informed the data gathering strategy at the various levels of analysis but dividing the levels of analysis into groups with differing interests proved useful in drawing out new lines of enquiry and questioning.

The next chapter provides a comprehensive summary of the case study and reflects on the outcomes and themes of the research project. An evaluation of the research methodology, theoretical framework and the contribution of the research are among the factors considered.

Fig 5.11 The Revised Framework Showing Methodology, Framework And Area Of

Application Together With Analysis Strategy
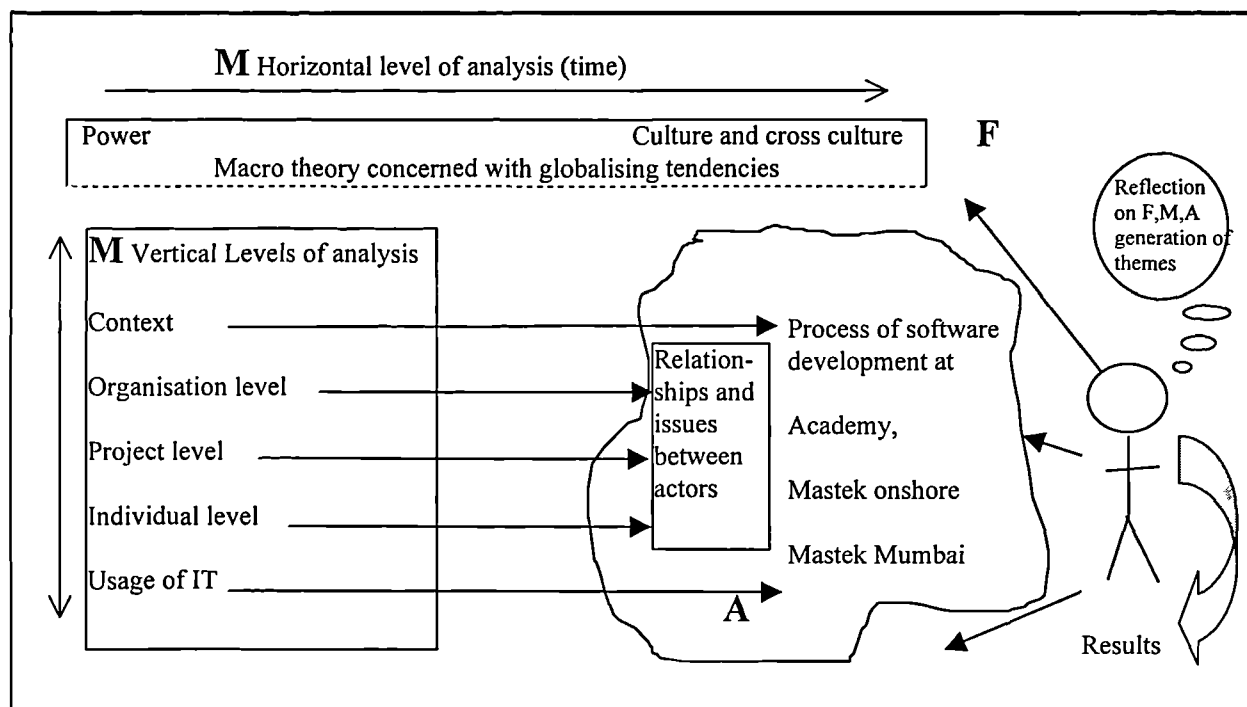
CHAPTER SIX

SUMMARY AND EVALUATION

6.1 Introduction

This chapter includes reflections on the research work, attempts to draw lessons from the case study and suggests recommendations for future work. The aim of this chapter is to summarise the key findings of this study and the implications for software development between UK and India. The second aim is to evaluate the study, to reflect on the research questions, consider the success of the process and contribution of the thesis. The chapter is organised as follows: an evaluation of the entire research study and outcomes using criteria derived from relevant literature is followed by consideration of problems and difficulties experienced by the author in using the chosen approaches. There is also some discussion on the refined framework for analysis followed by a summary of the major themes and findings. The final section is concerned with the contribution of the research, the lessons of the study and recommendations for further work. This structure emerges from the research cycle and is similar to that of Wood Harper's (1989) thesis.

6.2 Summary and Evaluation Of The Thesis Objectives

It is useful at this stage to recap on the research question which was addressed in this thesis:

What are the cultural and political issues involved in the process of information systems development across time and space?

How are these issues affecting the process of information systems development across time and space?

In order to answer these questions, the study addressed a number of issues. It examined the emergence of information systems development across time and space and discussed the importance of global software outsourcing as a particular area of business which is engaging in this process. Chapter one discussed some of the themes of globalisation and the information society which underpin these trends. Investigation of this process in an holistic manner so as to unpick the relevant human, organisational and management issues meant that research and theory from a range of disciplines was needed. Literature from international management, cross cultural studies, organisation theory, sociology and of course information systems was consulted. This was reviewed in chapter two. What actually constituted the relevant "human", "organisational" and "managerial" issues could not be pre-empted, indeed in the spirit of exploratory research in the social sciences, it was necessary to have in place a theoretical framework which would allow a range of issues to be considered. The literature review enabled the development of a theoretical framework, the initial version of which is

presented in chapter 3. The review also considered the use of computer mediated communication to enable a discussion regarding the use of IT in the process. Chapter four contains discussion and justification for the research methodology. Context - process analysis was chosen because of its holism and longitudinal orientation. Given the exploratory nature of the work it was impossible to know what issues were going to emerge from the study over time and thus an approach which has been shown to be useful in exploratory situations offering an holistic approach was chosen. In analysis strategy, context process analysis has some similarities with the grounded theory approach in that the interaction between data, framework and researcher results in the emergence of themes related to the research. Field interviews took place over twelve months with Academy and Mastek, the interview findings were analysed using the theoretical framework as a guide to learning. This is outlined in chapter five.

6.3 Evaluation Of The Research Process

It is important that the research is judged against accepted criteria so three relevant evaluation frameworks were chosen to undertake this analysis. Myers (1997) offers a number of criteria which can be applied to evaluate interpretive research. Klein and Myers (1999) have provided a more comprehensive schema which encapsulates seven principles for evaluating interpretivist case study research. Finally, it would be inappropriate to ignore the work of Pettigrew (1985a) with regard to the criteria by which context - process analysis should be judged. The analysis to follow will use these three frameworks to evaluate the case study discussed in chapter five.

Does the research make a contribution to the field? Has the author developed any new concepts or theories?
Does the author offer rich insight into the human, social and organisational aspects of IT and their application
Does the research contradict conventional wisdom and provide richer understanding?
Has a sufficient quantity of data been collected for insights to emerge?
Are multiple viewpoints and alternative perspectives represented?
Has sufficient information about the research method and process been presented?

Fig 6.1 Criteria To Judge Interpretive Research (From Myers 1997)

Fig 6.1 shows the criteria identified by Myers (1997) which will be first under consideration. Issues of contribution are discussed in detail later in this chapter but it is argued that the research does make a contribution and although does not offer new theories contributes to an awareness of issues involved in the process of information systems development across time and space. Whether the research provides "rich insight" or not is subjective however, the analysis of the data provides rich insight into the complex cultural and political issues which affect information systems development across time and space, specifically between India and UK. The rich insight concerning the potential for the instrumental use of cross cultural characteristics in order to obtain power in GSO relations offers a new facet on development across time and space. With regard to contradicting conventional wisdom, the research sought to contradict the technical / rational view of information systems development. The view that prevails amongst some companies and writers is that the process of software development is a rationalistic engineering occupation and that social and political issues are unimportant. The "hard systems" view of software development is deeply entrenched in IS development and the research sought to contradict conventional wisdom in this respect.

The research also challenged conventional wisdom with regard to the traditional view of a uni directional effect of globalisation from West to East whereas the research indicated a reverse process of globalisation. These factors are significant as examples of rich insight justifying the single case study design.

With regard to data issues in longitudinal process research, Pettigrew (1985a) acknowledges that it is difficult to know when to stop collecting data and when to undertake more interviews. There is no upper limit on interviews of course other than the considerable cost of field visits to India and the problems of being "swamped" by data. In a single case there is also the issue of ensuring that access continues for the agreed period set at the start of the study. The importance of making a valid contribution to the interviewees is also of significance as they are being asked to give up time to meet and discuss issues and expect something to come from it. In this case, feedback to participants came in the form of informal comments or more formal reporting. All in all, the research continued for the agreed period at the intervals discussed until nothing new was being learned from interviews. Multiple viewpoints were gained and represented by interviewing staff at various levels of analysis and often asking the same question. The viewpoints are represented by quotations from the respondents. As far as was possible, the data were checked with archival and other sources, for instance the management buy out of WWDC was checked in the press and the Mastek Quality Methodology documentation was provided.

With regard to the research methodology and process discussed in chapter 4, considerable detail was provided in terms of the chosen philosophy and underpinning detail of the method.

Klein and Myers (1999) provide a more comprehensive schema directed specifically at those who would evaluate interpretive field studies in information systems. The principles are shown in table 6.2 below.

| 1. The fundamental principle of the hermeneutic circle |
| 2. The principle of contextualism |
| 3. The principle of interaction between the researcher and the subjects |
| 4. The principle of abstraction and generalisation |
| 5. The principle of dialogical reasoning |
| 6. The principle of multiple interpretations |
| 7. The principle of suspicion |

Table 6.2 Summary of the Principles for Interpretive Field Research (Klein and Myers 1999)

Taking each of the principles in turn, the fundamental principle of the hermeneutic circle is described by Klein and Myers as resting on the assumption that all human understanding is achieved by iterating between considering the interdependent meaning of the parts and the whole they form. They give the example of linguistic interpretation which is always context dependent. In the research inquiry, the interviews, documents, records and case study notes were ordered, explained and interpreted by the author in a continuing attempt to make sense of the "whole" by moving between description and understanding of the parts and of the whole. As more information was gathered, the author's understanding of the process increased. The hermeneutic process continued until the absurdities, contradictions and oppositions in the organisation no longer seemed strange but made sense. An example of this concerned the complex set of

events which led to the resignation of the West Wilts programmers one factor of which was only understood by iterating between the whole (one factor of which was Indian culture) and the respective parts of the process (Indians' use of methodology). This could not be achieved until fieldwork had taken place in India and was not fully understood by the author until after the period of extended stay in India at IIM Bangalore living within the Indian culture and having many discussions with academic colleagues.

This example is also relevant to the second principle, that of contextualisation. The research was undertaken using a contextualist method and thus the importance of the impact of context on process was fundamental. The narrative introduces both companies and an historical backdrop was provided at various levels of analysis. An example of the impact of context on process was seen in the influence of the entrepreneurial, competitive Capita group which had an impact on the embryonic Academy which in turn affected the outsourcing relationship and thus the process of software development. Other examples concern the impact of Indian culture (submissiveness and attitude to time, both contextual factors) on the process. This was discussed at some length as were the consequences of risk with Indian contextual structures and systems impacting on a global software process.

The third principle concerns the interaction between the researcher and the subjects. Klein and Myers point out that in social research the "data" are not seen to be sitting there like "rocks on a seashore waiting to be collected" but as facts which emerge as part and parcel of the social interaction between the researcher and the participants. By way of evidence for this, the author provided as complete a discussion as possible on

the data collection techniques and also discussed the changing role of the researcher. The author also discussed how the contextual relationship between Capita, Academy and Mastek had changed over time and affected their perception of the researcher (from objective observer to "spy in the camp"). Also of relevance was the discussion concerning the motivating factors which the participants had for engaging in interviews over time. In particular the effect of the researcher in "action research" role is recognised as impacting on decisions which Academy and Mastek have taken. The interim report for instance encouraged Academy to move to new organisational forms (the switching capacity discussed in chapter 5) and Mastek recognised the differences in status between the onshore and offshore groups leading to the "buddying" scheme.

Further dimensions of this principle are elaborated by Klein and Myers who refer to the work of anthropologists and specifically quote from Read (1965). Read, in his engaging ethnographic account is said to have provided "vivid insights into the life and character of the people". By way of evidence for this principle, the author attempted to use copious quotations from participants and some personal asides are provided to bring the case "to life". For instance the author's feelings about the nature of travel in India is discussed, as was the contextual difference between Mumbai streets and the office architecture. The author's reaction to personalities of key leaders was also recorded and discussed (e.g. Kelly, the balding, tough character and his attitude to the ponytailed young programmer). However, it is recognised that the author did not fully engage with this principle in the narrative mainly because the author was influenced by exemplar studies from Walsham (1993) and Walsham and Waema (1994) who do not engage with this principle fully themselves, which Klein and Myers accept. The author's future studies would concentrate on offering a less "objective" account of

events and instead on providing a narrative, following Read (1965) "as it appears through my own eyes, filtered through my own background, my likes and dislikes, qualified by my own strengths and weaknesses".

Klein and Myers fourth principle concerns abstraction and generalisation. It requires the relating of the details revealed by the data interpretation to theoretical general concepts that describe the nature of human understanding and social action. In this inquiry, the findings are discussed in relation to Giddens's (1990, 1991) writings on globalisation. Theory is seen to play an important part in the analysis and generalisation of this research by the drawing of specific implications and providing rich insight (Walsham 1995). The use of social theory in this case has offered a vocabulary for discussing the details of the case study and has provided a "sensitising device" (Walsham 1995) to view the world in a particular way.

The fifth principle, that of dialogical reasoning requires the researcher to confront his or her preoccupations and prejudices which guided the original research design. The historical intellectual basis for this inquiry was made as transparent as possible in chapters three and four. Once again, the exemplars in use by the author (Walsham 1993, Walsham and Waema 1994) are recognised by Klein and Myers as not demonstrating this facet. However, by way of evidence for this principle, at the start of the research inquiry, the author was to some extent preoccupied or prejudiced into the belief that GSO involved some form of exploitation of developing countries by large multi national corporations through the traditional uni directional views of globalisation. The reality of the case study to an extent confirmed this view but also contradicted the prevailing unidirectional view of the consequences of globalisation by presenting a facet

of the reverse effects of globalisation. Secondly, the "polished" theoretical framework emerged over time and went through many iterations both before and during the fieldwork as data gathering took place. The coming together of the theoretical framework was in many ways an iterative "messy" process, far from the rationalistic view of positivist inquiry.

The sixth principle of multiple interpretations requires sensitivity to possible different interpretations among the participants as are typically expressed. The way this is achieved, according to Klein and Myers is by multiple narratives or stories of the same sequence of events under study which are in some ways similar to multiple witness accounts. By way of evidence for this principle, the narrative in chapter five includes multiple viewpoints and copious quotations from interview transcripts. An example of how multiple viewpoints are expressed is shown in the early use of Mastek programmers at Academy and the resultant resignation of WWDC programmers. This was perceived as "moving to a disciplined methodology" (Project leader Mastek) "tightening control over the process" (Academy Housing Manager); "an interesting sociological experiment" (Peter Kelly, MD) or an intrusion, authoritarian gesture and attempt at control (shown by the WWDC programmers' decision to resign).

The final principle is the principle of suspicion that requires sensitivity to possible biases and distortions in the narratives collected from participants. In this inquiry, by taking a cultural and political view on the process of software development it was noted for example that cross-cultural characteristics were being used instrumentally to augment the political aspirations of Academy management and facilitate change. Outsourcing itself was seen to be a political device to ensure that the Academy

management would have control over the Academy culture, any new corporate acquisitions and the development process itself.

The third framework for evaluation is derived from Pettigrew (1985a) who discusses the criteria by which contextualist research ought to be judged. These are shown in fig 6.3.
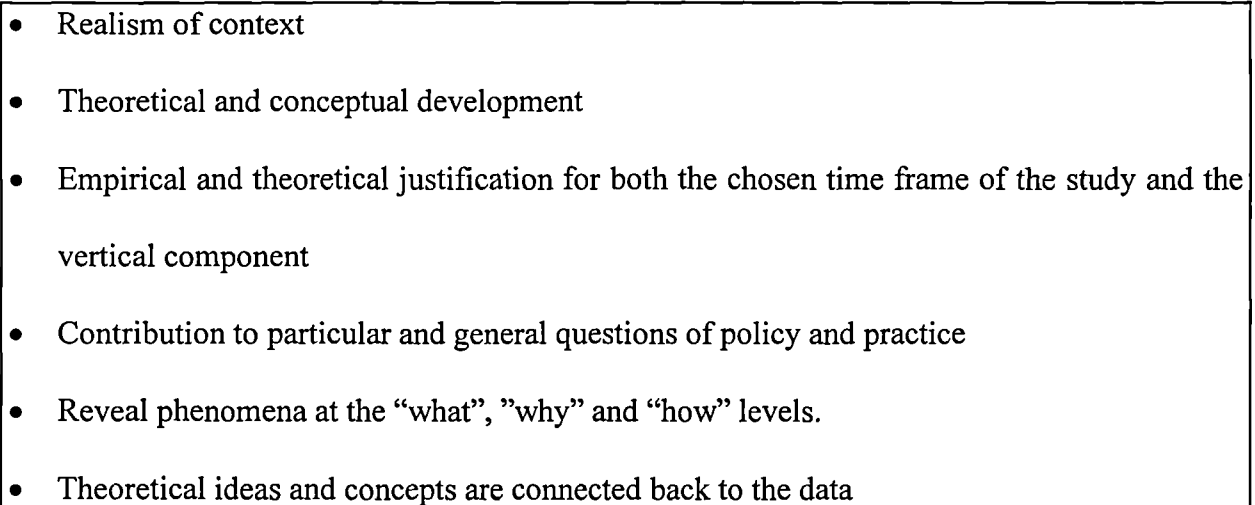
- Realism of context

- Theoretical and conceptual development

- Empirical and theoretical justification for both the chosen time frame of the study and the vertical component

- Contribution to particular and general questions of policy and practice

- Reveal phenomena at the "what", "why" and "how" levels.

- Theoretical ideas and concepts are connected back to the data

Fig 6.3 Criteria For Judging Contextualist Research (Pettigrew 1985a)

With regard to realism of context, the context was expressed as fully as possible in terms of the societal and organisational backdrop to the companies involved. The author's interpretations were included as well as many quotations from the case participants.

Theoretical and conceptual development was derived from a literature search and a combination of theories from sociology and organisation theory. The conceptual

development of themes was guided by reflection on the framework and the key themes formed the basis of the analytical narrative.

In keeping with Pettigrew (1985a) the description and analysis of the case study attain some balance between description and analysis. The role of description is to clarify and establish the context, structure and process to be explained. The event was described in its context.

Pettigrew (1985a) states:

"There must be an empirical and theoretical justification for both the chosen time frame of the study and the vertical component, the decisions made to restrict the levels of analysis to the group, the organisation or the social, economic and political context through which the process makes its way."

The chosen time frame of 12 months was a pragmatic decision to ensure that something useful and interesting was likely to happen and not to dissuade the company providing access by suggesting a period in excess of 1 year. Periodic interviews allowed relationships and issues to evolve and participants would sometimes have stored issues in their minds in readiness for discussion. The levels of analysis were chosen because they represented the key levels that influenced the process of software development. The analysis did focus on the project group as time went on mainly because that was where most of the interesting issues were emerging and due to pragmatic considerations of continued collecting and transcribing data from interviewees at multiple levels.

Pettigrew states that "the descriptive chronology should be interpreted by theoretical themes and / or being used to derive theoretical ideas and concepts". The theoretical framework developed in chapter 3 was constantly in the mind of the researcher and after interviews would be used to try and interpret events. At times the description would blend in to the analysis and this was to some extent desirable so as not to take a mechanistic approach. However, the researcher was learning about the methodology and trying new ideas during the course of the investigation (e.g. stakeholder analysis).

Pettigrew argues that process analysis should reveal phenomena at the "what", "why" and "how" levels. In the analysis of the case, particular occurrences are as far as possible revealed at these levels, "what" constitutes the description of the event - what actually happened. The "how" consists of mechanisms and events by which actors goals were achieved with theoretical insights. The "why" analysis is the attempt to provide theoretical insights into causal factors, explanations etc. These factors are present in the discussion, for example, over the instrumental use of cross-cultural characteristics to facilitate change at Academy.

The political analysis was useful in revealing the social mechanisms operating to guide, develop and alter the processes. Power structures and motivations are clearly specified and empirically established through the case study.

The final point made by Pettigrew concerns how adequately the theoretical ideas and concepts are connected back to the data. The major way that this was ensured was by having a constant dialogue in the mind of the researcher between the theoretical ideas and the interview and observational data. The connection of the data back to the

framework is shown in the large number of direct quotations from respondents and the realistic description of actual events.

6.4 Review Of The Research Methodology And Some Problems With Context Process Analysis

A problem in the use of context process analysis is related to coping with interviewing at the varying levels of analysis and the resultant volume of information. In any exploratory research situation part of the process is in honing in on what are the pertinent problems and issues and this sometimes led to the author feeling rather exposed, in fact Philips and Pugh (1992) in their text entitled "How to Get a PhD" advise against exploratory work for new researchers for this reason. Breaking the process into multiple levels of analysis over time was useful and helped to focus on the multiple interpretations and influencing factors involved in the process of software development. For instance the importance of the "umbrella agreements" with Capita was fundamental to power relations between Academy and Mastek. At the level of the project, it proved useful to examine the various actors and relationships as the project level of analysis is split between various social groups located across time and space. Analysing these various relationships at the project level of analysis opened up issues that proved useful for political and cultural analysis.

As well as the problems of information overload, problems of time were considerable. Travel to India and other field trips to Trowbridge took time and effort to organise and execute. Taped interviews took a substantial time to be transcribed and then would have to be read and re read at intervals. Discussion with colleagues was also time consuming

but necessary for the emergence of themes. All these factors meant that the research was very time consuming indeed.

With regard to the theoretical completeness of the approach, a strength of context process analysis is its holistic emphasis allowing the researcher to be sensitive to a range of issues. However, Pettigrew does not suggest a coherent analysis strategy and this research followed the analysis strategy suggested by Walsham and Sahay (1999). Analysis of data from context process analysis is left to contingency. The analysis strategy suggested by Walsham and Sahay could be criticised as being vague as they suggest "intensive discussion and reflection on the field data" to draw out themes. As a lone researcher it was sometimes difficult to find an informed colleague prepared to spend time discussing the interviews compounding the fact that all the interviews were undertaken alone. The author must have bored many a colleague to tears when attempting to formulate themes in the way suggested by Walsham and Sahay! It is felt that Walsham and Sahay's approach is well suited to research partnerships such as their own but the creative process of the generation of themes requires discussion and debate that cannot be done alone. Thus, although rejected by the author in the research design and by Walsham and Sahay (1999) for being too formal an approach, for lone novice researchers the use of scientific qualitative research strategies such as Grounded Theory (Glaser and Strauss 1967) alongside computer packages such as NUDIST offer the lone researcher some degree of support in what can sometimes be a lonely occupation.

With regard to choice of theoretical framework, it was felt that Pettigrew's assertion that one should go into a situation with a range of theoretical models and theories to refer to is highly desirable but unrealistic for a lone, novice researcher. Realistically, a novice

can only fully understand a small range of theories feeling confident to use them successfully. The implication of this is that exploratory work using context process analysis is better suited to multidisciplinary team. In a situation with a lone novice, the lack of knowledge of multiple theories to draw on nor the presence of a multi disciplinary team means that there is a danger that only issues which fit the theories would be uncovered - if one only has a hammer, every problem is a nail!

Interviews were semi structured, in the beginning exploratory and open ended but as time went on progressively focused. An ever-present problem with some interviewees was controlling digression as opposed to investigating a potentially interesting avenue of investigation. Toward the end of the investigation, emails would be sent to interviewees outlining the broad issues that would be helpful to discuss in the available time. Interviews with UK based Mastek staff brought out different viewpoints and perspectives but they in particular tended to be more conservative in what they said as they were unsure as to the status of the researcher. The relative openness of programming staff with India based staff is probably a reflection of the distance between them and the consequences of any repercussions. However, on the whole access was good and respondents very open with their answers to questions even when tape-recorded.

The position and role of the researcher was sometimes problematic. Mastek and Academy were and still are in a commercial relationship which was extremely sensitive due to the pending "umbrella agreement" with Capita Group. There was a need to establish the researcher's credibility via the interim reports to give the interviewees reason to continue the study. One problem concerned ascertaining what information

was confidential or sensitive to either side so as not to damage relations between the two sides. For example, the interim report gives reference to problems of staff attrition and draws attention to the resignation of a complete module programming team. Unknown to the researcher, Mastek had never told Academy about this as they encouraged Academy to treat the process in Mumbai as a "black box". The interim report was sent to Mastek first but was left unread. When Academy read about the resignation occurrence, it led to a crisis meeting to which the researcher was invited and embarrassed Mastek considerably. This lack of sensitivity on the part of the researcher led to a suspicion on the part of Mastek staff and continued access was only maintained by strong Academy contacts who were of course very keen to continue to have a "spy in the camp". This event did lead to Academy directors taking more interest in Mumbai operations to the extent that one director attended a Mastek customer event in India. Thus the position of the researcher and the perceptions of him by various groups changed over time.

The implication of the involvement of the researcher in altering events is also of significance. The interim report lead to several changes in the approach to methodology and relations between on and offshore staff in Mastek. This "Hawthorne effect" is significant and reflects the position of the researcher as sometimes being of the "impartial observer" and at other times in a much more "action research" role.

The other significant dimension concerns the clashing of the ethics of researcher and case study interviewees. Increasingly, the ethics of Academy in their instrumental treatment of the Indian workforce and asset stripping of UK organisations together with the "battery hen" approach to the Fordist production line in India became abhorrent to

the researcher and a withdrawal from the case study was at one point seriously considered. Visits to the case study site became rather an uninviting prospect wondering what unpleasant activities would have befallen the unfortunate staff. This relates to the role of the researcher in the investigation that is not and never can be totally objective. By way of commentary on interpretivist research, Jayaratna(1994) discusses at length the importance of the mental construct in interpreting events. Indeed, if viewed through a different "lens", or a different mental and theoretical construct the results of this study could have shown a very different picture. For instance, an economic analysis would have shown Academy profits soar, a view using the principles of Total Quality Management would present a picture of a smooth well controlled organisation. Interpretivist research by definition contains the interpretations of the multiple viewpoints and presents a particular set of views and realities that include the author's own. Thus it relates "stories" told through mental and theoretical "lenses" as a result of rigorous and systematic inquiry.

6.5 Discussion Of The Refined Framework

The refined framework was shown at the end of chapter 5. There are only minor changes to the original concept due to the need to separate out the various relationships between the levels of analysis. This was discussed in chapter 5. The framework was useful as a guide to learning and thinking about the case study and acted initially as a useful guide to the kind of questions which would be asked in interviews. The relationship between Giddens's work and the political and cultural analysis was significant. When used in practice, Giddens's work was useful as a means for detailed reflection on the issues after interviews had taken place. The main use of this was as a

vocabulary and means of expressing events for explanatory purposes. As a means to generalise case studies, the analysis can only ever be tentative. On the face of it, it would seem that other groups would be likely to be able to use Indian labour in a similar way to asset strip UK based companies. But there is no guarantee that other groups in different contextual circumstance s (e.g. economic, presence of a key leader figure etc.) may present moral or other objections. However, within the context of Capita, the activity is continuing in the same vein throughout other group companies.
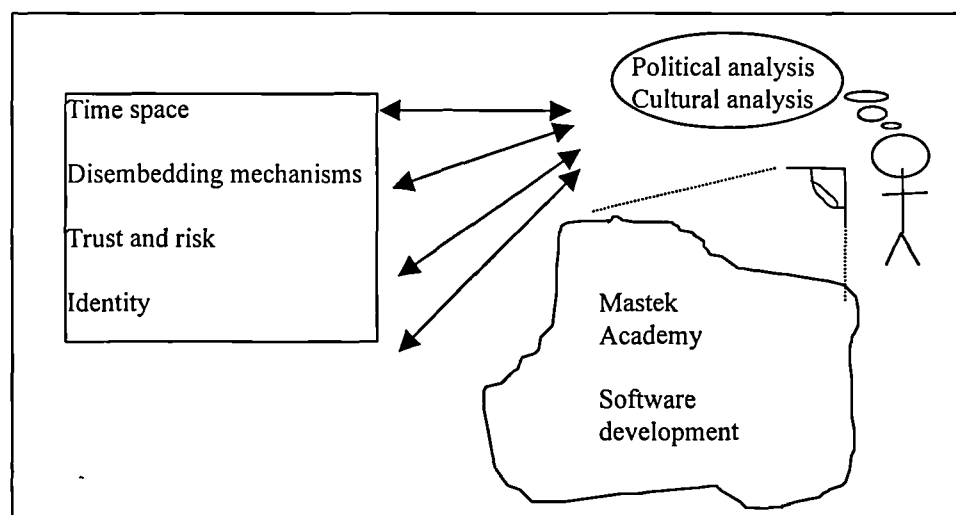

Fig 6.4 The Theoretical Framework In Action

Fig 6.4 attempts to give an impression of how the framework was used in action in both interviewing and analysing events afterwards. This was not done in a mechanistic fashion but as an aid to creative thinking. The various eventualities of the processes of globalisation suggested by Giddens served as a basis for reflection on the themes which were emerging from the political and cultural analysis, serving to enrich the discussion and generating new lines of enquiry and thought processes. For instance, reflection using the "identity" part of Giddens's ideas led to consideration of the importance of

Indian identity and what is "Indian ness". This was fruitful in identifying causal factors to the issues and themes.

The study has identified certain limitations in Giddens's theories for studies of this nature. A criticism often levied at Giddens writings concerns an emphasis on time over space (Tomlinson 1994, Urry 1991). The author was disappointed in the clarity of terminology with regard to time, space, place and distance the difference and interpretation of which is left to the reader. Importantly, the conception of time is taken as a given by Giddens which is embedded within the structures, rules and resources of modern societies. This means that Giddens theory offers a relatively blunt instrument to consider cross cultural contexts. The analysis ignores the issue of different structuring of time in different industrial countries. This inquiry has shown that Indians typically perceive time very differently to a British conception. Sahay (1998) points to many features of an Indian attitude to time including an indifference to history and a spiritual relationship to time which is coupled to beliefs in reincarnation held by some Indians. Giddens also largely ignores the role of IT in globalisation processes and thus does not discuss the blurring of time, space and place in work schemes involving for instance telework. Nor does he consider issues of access and inequality pertaining to the globalisation issues he discusses. With regard to place, Giddens is criticised for avoiding thorough analysis of place and concentrating on "modern" societies. Once again, this analysis ignores the issue of different relationships with place in different industrial countries. Places feature highly in Indian life and spirituality. Sahay (1998) points out that many Indian people take pilgrimages to holy places and the river Ganges features very highly in the psyche of many Indians. Whether India should be relegated to a "traditional" society is never addressed by Giddens. In conclusion, the major weaknesses of Giddens theories reside

in the conception of time and space restricted to "modern" societies, but Giddens never states which countries are the modern ones. The theories are useful but for cross cultural inquiry offer only a blunt instrument to provoke thought and creativity.

6.6 Summary Of The Fieldwork

The purpose of this section is to summarise the fieldwork. This section and the following describe unique aspects of the case study and the rich understanding which has emerged justifying the single case design. The richness of the case study material is difficult to summarise and distil however table 6.5 below is an attempt to draw out the major themes of the study. There are key points worthy of reflection. Firstly, the historical reconstruction of events prior to 1996 saw the introduction of outsourcing into Academy and the early bodyshopping relationship. This was the period when Peter Kelly, the managing director, was manipulating the organisational culture of the embryonic Academy. This was also the period when the original programmers from the disparate groups were ousted from the scene due to their threat as a counter organisation. The analysis argued that the use of Mastek Indian programmers both on and offshore was instrumental in achieving Academy management objectives. Later analysis showed how the teams were organised to attempt to exploit the time and space independence of work. It was shown that the process was not completely independent of time and space. Offshore development has offered economic benefits to Academy as well as flexibility but has led to a situation where the abstract requirements of a task are stripped away from the task itself. The commodification of labour in this way views workers as satisfiers within a process, a trend which is likely to continue at Academy and elsewhere in the Capita group. The ability to deskill and structure the work into

standardised "packets" was perceived by Academy management as allowing for the easy "switching" of suppliers in a way similar to Mowshowitz's view of virtual organisation (1994). With regard to complete offshore development, the case study indicates that it was impossible for all the development work to be done offshore, when the onshore offshore mix was too much in favour of Mumbai, the process began to crumble. Thus the whole development effort at present cannot be done by in Giddens's terms" absent others". This is interesting as it counters the thesis of the independence of time and space discussed in the literature review.

Cultural Analysis	1995-1996	• Competitive and aggressive Academy • External focus on shareholders and customers at Academy • Key personality of MD of Academy • Aggressive individualism of UK Vs passive collectivism of India • Mastek Indian staff change & form academy organisational culture	• Academy management desire to form a coherent culture: Subcultures at inception of outsourcing • Use of Mastek to facilitate change in Academy • Deference to authority & compliant Mastek programmers
	1996-1998	• Advance of Mastek up the trust curve • Problems of cross cultural mode of conversation • Development of software as a "black box"	• Status in Mastek teams between Mumbai and UK • Collectivist Mastek staff
Political Analysis	1995-1996	• Academy used control of technology outsourced Indian programmers and formal lifecycle to formalise the organisation and facilitate change • Methodology used to iron out diversity and make the work "people independent" • Methodology as a non human stakeholder with embedded interests • Local Mumbai context used instrumentally – Indians compliant due to lack of unemployment / social security	• Indian outsourcing used to coerce / dominate home organisation and remove counter organisation • Indian cultural characteristics used in an instrumental way, disciplined, compliant • Specifications and formalism allows increased central knowledge of activities
	1996-1998	• As Mastek move up the trust curve, become powerful through knowledge and control of the process Academy dependency • Academy's continued expansion and acquisition using Mastek to "asset strip" organisations	• Negotiating power of contracts: the umbrella agreement with Capita • Academy's plans for multi vendor capability to reduce dependency on Mastek
Globalising Tendencies	-	• Reverse process of globalisation	• Depersonalisation and commodification of human labour
	Time-Space	• Importance of time lag on problem solving and programmer anxiety • Importance of religion, family and public holidays in India	• Expectations across time and space different between cultures • Attitude to time and time keeping different in India
	Disembedding	• Importance of shared mental framework of Indians in the event of infrastructure problem in India	• No direct contact between offshore team and the Academy staff is permitted Process is perceived as a black box
	Identity	• Mechanisation of work - personal meaninglessness - no job satisfaction in the software factory • Etiquette training problems of persona and role	• Existential anxiety for onshore staff - retaining Indian identity
	Trust & Risk	• Black box software development process disguises the risks of global outsourcing in the form of the various overlapping systems which affect process of-software development	• Mastek move up the trust curve • Surveillance and trust issues related in meeting customer expectations. Mechanisms for reassurance (videotaping programmers at work etc.)

Table 6.5 Summary Of The Themes From The Fieldwork

With regard to use of technology for collaboration across time and space, Academy are only using email and FTP within an all Indian group which does not allow communication between any Mumbai based team and Academy, their client. The advent of economic and reliable video conferencing may alter the IS development approach and methodologies in the future and is an area of future research potential.

With regard to aspects of globalisation, the reverse process of globalisation was discussed which contradicts the traditional prevailing view of "one way effect" of globalisation from developed to developing countries. Dimensions of time concerned the freshness in mind of problems due to time differential, differing expectations between client and customer, the number of holidays in India and the need for a shared "mental framework" in order to understand the local context and its problems and issues. The importance of the local context was key in this case due to the importance of understanding UK taxation, housing etc. which necessitated rotation of staff from India to spend time in the UK context.

Evidence for Academy and Mastek moving up a linear "trust curve" between outsourcer and customer is shown in the case study but later events show that that process can be reversed when dependence becomes too great on the outsourcing company and the client looks for ways to ensure continued value for money and to free themselves from the dependency. The later political analysis shows that power is shared between Mastek and Academy, Mastek management being aware that they could bring Academy "to its knees" and Academy realising the power of the substantial size of contract.

Another dimension of the time space independence of work concerned problems of staff attrition which are a result of the volatile Mumbai context and also as a result of an unpopular platform used at Academy. The programmers in Mumbai have poor job satisfaction and have only superficial loyalty to their absent clients. This has opened Academy up to unprecedented risk. These elements of risk were identified when considering the various overlapping systems which exist in India which Academy has become exposed to. Aspects of Indian identity were also discussed, the etiquette courses, problems over accents and mode of communication. Personal meaninglessness in the software factory and existential anxiety over roles and choices were all key themes.

6.7 Contribution, Lessons And Implications Of The Fieldwork

This section will consider the lessons and contribution of this research for the following major groups:

- Management: The implications for practice especially for those UK managers who are in charge of software development projects to India, those involved in Global Software Outsourcing or in control of the process

- Theoreticians and academics: this is directed at those who would engage in further work in the area of software development across time and space

Table 6.6 provides a summary of the lessons and implication of the research for these groups regarding issues of policy, theoretical and methodological issues and contribution to the field of practice in IS development and research.

	Management Implication	Theoreticians, academics, policymakers
Contribution to issues of policy	• Ethical codes of practice for knowledge work • Implicit guidelines on GSO including issues of culture, power and implications of globalisation. • Potential pitfalls of coercive strategies: short termism, loyalty vs. profits etc. • Extent to which the process is independent of time and space - when co presence is required	• Instrumental use of Indian cultural characteristics - legislation on knowledge work in virtual organisations • Depersonalisation and commodification of human labour contrary to the optimistic vision of virtual organisation (e.g. Handy 1995)
Theoretical & methodological Contribution	• Literature review • Cross cultural implications & dimensions of software outsourcing between India and UK • Weaknesses in structured IS methodology implications for software development • Risks of outsourcing and development in other countries due to the various overlapping systems • New relationship forms: Switching and multi vendor capability	• Provision of a framework for investigating issues of globalisation, culture and power when software development is taking place between countries • Value of interpretivist case in such inquiry • Reverse process of globalisation contribution to the macro theory • Debates concerning the implications of the information society (Bell v Lyon) • IT related "micro case" study contributes to "macro theory" (Walsham 1998) • The trust curve can go into reverse • Socio technical school _ deskilling , neo Fordism, job satisfaction • The need for new IS methodologies for GSO - critique of the dominant structured approach for virtual teams
Contribution to the field	• Software development can not be independent of time and space - a degree of co presence is required	• Political and cultural analysis contributes to literature • Presents critical view of virtual teams and "information age" practices • Indications of the use of context process analysis for novice researchers, the need for multi disciplinary teams

Fig 6.6 Contribution Of The Research

6.7.1 Lesson 1 There Is A Need To View The Broader Social Context In GSO Relations

In order to study the human, organisational and managerial implications of the process of information systems development across time and space, a cultural and political analysis has been undertaken. In addition, the analysis of globalising tendencies has

shown the need to view this phenomenon in the light of a broader social context and the backdrop of the effects of globalisation. A central lesson of this research concerns the need to understand the cultural and political implications of information systems outsourcing to India, a trade that is becoming increasingly important. Key contributions of the case study concern the viewing of this phenomenon in the light of a broader social context and the backdrop of the effects of globalisation.

6.7.2 Lesson 2 Cross Cultural Dimensions Are Important

The case analysis highlighted the need to examine the potential for instrumental use of cultural characteristics in order to subjugate, in Giddens's terms, "absent others". The analysis also examines the potential for the instrumental use of Indian labour to create and maintain power structures through rationalistic methodology and a Fordist division of labour. Cross cultural factors such as Indian attitude to time, submissiveness and eagerness to please were seen as related to political issues and significant in the process of information systems development across time and space. Table 6.7 shows a summary of the findings of this inquiry together with some tentative indications of how this might affect the IS development process between UK and India. Generalisations are not implied as conclusions are based on single case data, however many of these themes are emerging in the practitioner literature, for instance Terdiman (1999) reaches some similar conclusions.

Indian Cross Cultural Theme	Effect On IS Development Process Between UK And India
Deference to authority	• Indian programmers used politically to facilitate change in UK companies • Avoidance of risk, Indian programmers may stick to the methodology or do nothing and wait rather than risk a creative response. • A tendency to agree and say "yes". An unwillingness to interrogate superiors or question them could lead to misinterpretation and differences in expectations.
Attitude to time	• Missed deadlines (has many other causes e.g.: infrastructure, estimating on UK benchmarks). An Indian team in UK may be needed to communicate with offshore team as they share contextual knowledge.
Dignity and "saving face"	• Indians protect their own and others' dignity. This could lead to a reluctance to question or risk making mistakes or bring bad news e.g. project management delays.. Tend not to publicly correct others even if they are wrong. Can lead to misunderstandings or differences in expectations.
Verbal communication	• UK staff may interpret Indians as strict, formal, sometimes abrupt in manner affecting cross cultural group process.
Body language	• Indians will shake the head from left to right to indicate "yes". Eye contact is lower than in UK. Could cause problems of affirmation and trust.

Table 6.7 Some Cross Cultural Differences Affecting the Process of Software Development Between UK and India

6.7.3 Lesson 3 The Nature Of Work In The Process Reflects A Reversion To Scientific Management

The potential for managers to instrumentally use Indian developers to subjugate their existing staff in the UK or asset strip corporate acquisitions is clearly a possible strategy. The strategy takes a view of organisation and people which is concerned with the abstract requirements of a task and the most efficient means for satisfying the task requirements. Programming staff in this case study are seen in an instrumental way as merely satisfiers within the process. This strategy represents a return to Fordist methods of production engendering very little long term job satisfaction, respect for the worker or in return loyalty to the company. The work of Mumford (1984) in the IS area has been particularly influential by prescribing a socio technical view and the research contributes to that body of literature. Because of these factors, the strategy shown at Academy could be indicative of a dangerous short termism given the volatile nature of

Indian software industry where prices are rising quickly. Attempts to shift between the cheapest world suppliers reflects a realisation of Mowshowitz's (1994) vision of rational switching between suppliers like the "virtual memory of a computer". As Walsham (1994) points out in his reply to Mowshowitz's rationalistic vision of virtual organisation, reciprocal staff-employer loyalty is a key characteristic of being human.

6.7.4 Lesson 4 Management In Virtual Teams Is Potentially Coercive

This case study raises the spectre of an alternative paradigm of management for the information age. Far from offering a vision of trust, the globalisation of knowledge work presents a vision of exploitation, concentration on narrow economic goals, surveillance and coercion. This is particularly profound given that the most recent writings on the management of "knowledge organisations" and "network organisation" call for partnership, trust and co-operation with employees (Handy 1995). This research presents a very different view of life in the virtual work to that of Handy (1995). In the face of the extreme excitement and optimism regarding so called "virtual" organisation, the research contributes to that debate sensitising theorists and practitioners to the potential for coercion. The research thus contributes to those policy makers concerned with the ethics and regulation of information age work across national boundaries as well as trade union bodies concerned with the globalisation of knowledge work and potentially coercive practices.

6.7.5 Lesson 5 Globalisation Is Not Uni Directional In Its Effects

The course of events at Academy provides an interesting example of the processes of globalisation and it could be argued that it indicates a set of "reverse effects" which are normally not discussed in the popular literature. The effects of globalisation are often discussed in terms of the impacts (quite often negative) that Western culture and management methods have in other cultures, a process that in recent years has been intensified by the effects of mass media. For example, the work of Ritzer (1995) identifies a burgeoning "McDonaldisation" of society, a thesis that essentially rests on a critique of the increasing pervasiveness of scientific, systematic and arguably dehumanising management methods. Other authors have been critical of the exploitation of developing countries for cheaper labour costs due to the ease of shifting production facilities overseas. The implication of IT in the processes of globalisation has led some authors to warn of "electronic sweatshops" and a "new managerialism" (Attewell, 1987), and the effects of mass-media in creating a "cultural colonialism" (Martin 1995). Interestingly, in this case, the Indian software analysts were trained in what could be described as a Western developed management method; the rigorous ISO 9001 accredited software quality development process. This methodology and the compliant, systematic adherence to it was interestingly re-exported back from India into the UK to be used as a mechanism for coercion by the UK management of their own employees. In this case, the effect of globalisation has not just been to import Western management methods into a foreign context, but in a more sophisticated way to exploit the cultural differences between the countries in order to achieve a satisfactory power arrangement in the West. Interestingly, a similar example of reverse effects of globalisation are also

demonstrated by another case study of software outsourcing to India by Japanese firms recently undertaken by Sahay (1999). In this case too, the Indian programmers who typically have had prior software development experience with North American firms are seen to bring in formal software development methodologies like the "waterfall methodology" to the Japanese firms. The Japanese approaches to software development typically do not involve extensive documentation but rely more on discussions and personal face-to-face contact. The introduction of these methodologies are creating quite a few ripples within the Japanese firms whose managers are feeling rather uncomfortable with the changes that are being implied by the move to written work. They describe the Indians to be "too Westernised" and are contemplating the change of the off-shore outsourcing model to an on-site one where the need for verbal communication could be maximised.

The implication and contribution of this case is that software outsourcing in the context of globalisation provides an interesting example of how the local interacts with the global. Also, it indicates that globalisation effects are not necessarily going to be uni-directional from developed to developing countries as in the traditional model, but increasingly we will be finding examples of local events (like in India) shaping global structures.

6.7.6 Lesson 6 The Potential For ICT's Is Significant For GSO

The adoption of advanced communication technologies and electronic networks is transforming the process of software development when time and space separate development teams, the analysis showed many exciting possibilities. Changes in team

organisation are enabling multi skilled teams which can operate across continents enabling wide access to international resources. Possibilities exist for UK based companies to move to new forms of relationship where software "packets" can be rigorously specified and sent for programming by teams anywhere in the world. Widespread use of video conferencing may have an impact on methodology allowing face to face contact between teams.

6.7.7 Lesson 7 New IS Development Approaches Are Needed for IS Development Across Time and Space

The research has contributed a critique of the dominant structured approach of development exposing its limitations and means by which it may be used for political ends, deskilling the process and affecting the professional identity of Indian employees. As more sophisticated work is transferred offshore new methodologies are being considered. This will have an impact on job satisfaction and enrichment issues but will draw UK based companies into greater levels of risk. The research has begun the task of uncovering such issues which would need to be taken into account in any new methodology or approach. It is suggested that a methodology panacea would not be appropriate to match the complexity of relations in IS development across time and space. Viewing the process from the engineering perspective is disastrous as it takes a view of IS development as culturally neutral. The lessons of the research discussed above demonstrate this is not so. The managerial, political and cross cultural issues identified in this research cannot be addressed by methodology or quick fix training programmes but by a process of attempts to reach a mutual understanding. Lesson two summarised some of the key cultural differences which may affect the process of IS

development between India and UK. The obvious action to take from the differences is to recommend training for Indian programmers to reduce the impact of these factors to a minimum. The author does not suggest this.

If organisations are serious about maintaining long term trusting relationships between UK and Indian software development teams then a process of holistic mutual education should take place. This is difficult to prescribe but the author has some concrete suggestions which, it is believed would make an impact.

- UK managers and GSO clients should be encouraged to visit India, to take note of the infrastructure conditions. Ideally, they should be encouraged to travel and read into the country's history, traditions and systems of education. This may form part of an induction for clients marketed as part of the introduction to the company.

- This could be followed by a series of ongoing seminars which may be delivered by Indian and UK staff or by the GSO manager concerning key issues and dimensions.

Importantly, the process should be ongoing and iteratively building mutual understanding. Workshops on topics such as cross cultural differences and how to deal with them should not be seen as the responsibility of Indian staff but in the interest of UK clients and developers as well. Another example could be attrition which should be perceived as a joint problem which is solved or understood co-operatively. Perception of attrition as being the Indian outsourcer problem ignores issues of platform popularity which in India which can affect attrition rates.

Education should not be of the "quick fix" training course variety but a serious exchange of views between UK and Indian staff. The involvement of offshore teams can be fulfilled by the rotation of UK managers regularly visiting India and a rotation of Indian staff at intervals.

6.7.8 Lesson 8 Those Who Would Engage In GSO Should "Open The Black Box"

Firms in the UK who would outsource projects to Indian companies should be aware of the risks they are exposing themselves to which are not usually apparent in the sales literature of outsourcing companies. Moving more of the lifecycle activities offshore opens the UK client to increased risk for a decrease in cost. By way of concrete suggestions directed at UK and Indian companies, visiting India and the offices of the company at least once is an essential prerequisite to understanding the local context, pressures and people. Taking an interest in the day to day work of the Indian on and offshore allows the UK client to monitor the continuing and changing risks as identified in fig. 5.10.

6.7.9 Lesson 9 The "Trust Curve" Can Go Into Reverse

Heeks (1996) asserts that there is a linear trust curve containing several stages of trust which relate to the sophistication of the relationship. The latter interviews at Academy revealed that Academy management were uncomfortable with the level of trust and were considering fragmenting the relationship enabling them to distribute "packets" of coding work to multiple vendors in many different countries. Thus the cost would be kept low while maintaining the capability of shifting resources between countries and

companies. These new forms of relationships will likely become more common as emerging software centres in China, Philippines and Vietnam become trusted by mainstream UK companies. In this way, the relationship is seen to be dynamic and suggests Heeks' (1996) model of the GSO relationship continuum is simplistic with regard to conception of trust and the linear, unidirectional nature of the model.

6.7.10 Lesson 10 Information Systems Development Cannot Be Completely Independent Of Time - Space

The analysis showed that information systems development can not be wholly independent of time and space and that a degree of bodily co presence is required. The splitting of teams with an onshore offshore mix was significant in arriving at a satisfactory arrangement given the range of factors involved. Also, the need for a "cultural interpreter" who would have local knowledge in the event of difficulties is significant when social relations are disembedded. The impact of time lag due to differing time zones is a cause of anxiety. Indians when situated in India, their own cultural context, are seen to have differing attitudes to time, priorities of work and family and the importance of deadlines. A need to have an Indian staff member on site is also related to issues of trust, the need for UK staff to see someone on site, or for reasons of intellectual property in highly competitive niche software development. The implication of this is that those practising in the area of GSO and information systems development across time and space should be cognisant of the issues around the types of activity which require co presence and the risks associated with attempts to wholly outsource complex projects to India.

6.7.11 Lesson 11 The Framework Has Proved Useful

Another area of contribution concerns the provision of a framework for examining the issues involved in Indian outsourcing and GSO generally which takes into account macro theory. The political and cultural analysis provides a novel insight for practitioners and researchers. The critical view presented by the empirical work of the implications of virtual teams and "information age" practices is in contrast to much of the speculative writing containing many superlatives concerning "cyber reality", "virtual worlds" etc. This should be of value to those considering GSO or development by teams separated by time and space. The research contributes to those organisation theorists or IS designers concerned with developing methodologies or frameworks of an emancipatory or human centred nature who would be made aware of the problems in viewing IS development as independent of time - space. The research has also contributed by evaluating the use of context process analysis for such an investigation and the appropriateness of interpretivist approaches. The research also provides a field guide and example of the problems and use of context process analysis which should contribute to future novice researchers. The limitations of the approach for a lone researcher and factors such as the need for multi disciplinary teams are significant.

6.8 Further Work & Recommendations

In the spirit of the research cycle, the above lessons can be used as a springboard for further research. There are two suggestions concerning empirical projects which are under consideration by the author and a policy level recommendation which the author will raise in various forums.

6.8.1 Recommendation 1 The Global And The Local Effects

Any future studies of global software outsourcing will need to seriously look at the local-global relationships and how they influence and are also influenced by the processes of outsourcing.

6.8.2 Recommendation 2 Moving More Sophisticated "Low Structure" Work To India

Further work should concentrate on the potential for more sophisticated work to be moved offshore and the implications for specific emerging ICT's in facilitating it, such as video conferencing. Studies could include:

1) A case study examining the emergence of new development methodologies for customer led design and prototyping across time and space using video conferencing. This would provide an interesting area for longitudinal study examining power and culture issues.

2) A survey of Indian software outsourcing companies in for instance Bangalore examining methodology issues and the types of work being undertaken (low v high structure (McFarlan 1995)) and the ICT's being used to facilitate interaction across time and space.

6.8.3 Recommendation 3 The Ethical Dimensions Of GSO

A specific implication of this research is the recommendation that those who have responsibility for professional ethics in IS (e.g. ACM, IFIP, relevant trade Unions) to be made cognisant of the issues contained in this research and make their members aware of the political and cultural implications of software development across time and space. As no international standard is in existence for the practice of GSO then the potential for unscrupulous activity continues with particular regard to the instrumental use of Indian labour to asset strip companies and subjugate UK based staff. The activity of Academy and Mastek is lawful but has debatable ethical credibility. A code of practice is needed which would allow UK clients and staff to know that staff on all sides will be treated in an equitable manner.

6.8.4 Recommendation 4 Achieving Mutual Understanding In The Process Of IS Development Between UK and India

The final recommendation of this research is that the actions suggested and discussed in lessons 7 and 8 be tested in practice in the form of a *suitable action research study*.

SOME KEY PRELIMINARY IMPRESSIONS FROM THE VISIT TO MASTEK BOMBAY AND ACADEMY

Brian Nicholson **July 1998**

1. INTRODUCTION

The purpose of this document is to briefly outline some key impressions following my recent trip to Mastek Bombay and two previous visits to Academy in Trowbridge. The data is collected from 5 interviews at Academy carried out on 8th December 1997 and 26th January 1998 and 6 interviews at Mastek Bombay carried out on 23/24 February 1998. An analysis of notes and taped interviews together with secondary material has been the basis of interpretations.

The objective of this document is to serve as a validation and correction of my understanding of the outsourcing programme. Another objective is to highlight issues which require further analysis with Mastek and Academy. The final objective is to give some preliminary analysis in the spirit of the "action research" approach adopted in the form of an overview SWOT analysis.

The document is structured into sections. In the first section I summarise the research questions. I then briefly outline the companies followed by the key actions and events leading up to outsourcing. Following this I identify some interpretations concerning main themes arising in the ongoing Mastek / Academy relationship. This is followed by some preliminary analysis in the form of an indicative SWOT. Finally I highlight key issues which require further analytical focus.

2. SUMMARY OF THE OBJECTIVES AND RESEARCH QUESTIONS

The objective of the research is to investigate the process of information systems development across time and space and draw implications for practice.

- How does software development take place when using development teams based in different countries collaborating using advanced communications technology?

- Why is software development successful or not under these circumstances?

3. THE COMPANIES

Academy are a software house part of the large Capita group of companies. The company was founded in 1995 as a series of software product acquisitions. They employ approximately 100 staff and turnover around £10 million which makes a contribution of around 25% of the group profitability. They are situated in Trowbridge in what was once West Wiltshire DC offices.

- **History of Academy**

In 1993 West Wiltshire District Council attempted a management buyout of its software product for council tax and benefits administration and business rates. When the Government imposed the poll tax initiative, West wilts were one of the few councils who were able to develop software themselves and offer it to other district councils. The people involved in this staged a management buyout but the public auditor deemed it fraudulent and WW district council were forced to take the development back in house. Capita made an offer for the software business in 1993 and bought WW software. The following year Peter Kelly joined the company and acquired the rights to a housing product from Sherwood computing. Later that year Academy management acquired a small company Dataflow. Academy's first office was in Trowbridge in the West wilts DC offices trading for the first time in 1995.

Mastek are a Bombay based outsourcing company with a software factory in Bombay serving the USA, India and Asia Pacific regions. They were established in 1982 and went public in 1992. Mastek have a satellite operation in Mastek UK which is purely administrative. The company turns over around £15 million across the group. Approximately 120 staff are employed in UK operations.

- **Events in outsourcing**

Peter Kelly Managing Director of Academy initiated the outsourcing of software development in November 1995. The motivation for outsourcing was primarily a *resource issue* with a desire to tap into the large Indian software manpower pool. It was recognised that tapping into this pool could offer a logistical advantage in that people can be found at short notice. There was also the recognition of a high level of English *literacy* in India , a large number of computer science graduates and lower costs as staff in UK tend to cost on average 30% more than Indian programmers. Cost was not the major motivation in Academy's case however. Academy's poorly regarded geographical position coupled with a countrywide shortage of experienced programmers left it vulnerable to a UK skills shortage. There was also the need to bring a coherent organisational culture as Academy, part of the acquisitive Capita Group, is made up of a series of corporate acquisitions. Staff who came with these different acquisitions had very different views of organisational life and of how software development should be undertaken.

The academy product portfolio consists of a housing product from Sherwood and Dataflow and a revenues product from West Wiltshire District Council. There is also an Income Management and Receipting product which is involved in outsourcing but to date is outside of the study. There was a desire in the new Academy management to form a homogenous disciplined work culture with an emphasis on efficiency and quality. This factor was a major motivation for Indian outsourcing and for using Mastek.

The outsourcing activity began with 4 Indian Mastek programmers on site at Trowbridge who were assisting with workload in the housing department. This introduced the Mastek Quality methodology (a waterfall methodology which is consistent with ISO9000 accreditation) which necessitates a structured disciplined

approach to development and project management. As Academy management increased their trust in the competence and capability of Mastek programmers the Mastek staff took over the Academy housing product development and part of the work was transferred offshore with some key staff remaining onshore. As Mastek programmers showed competence in housing development the Mastek methods and employees were subsequently "rolled into" Academy housing. This led ultimately to the resignation of the West Wiltshire District Council programming staff and complete adoption of the Mastek methodology and staff for all development work in Academy. A period of intense development took place until the products were seen to be well understood and robust. The housing and revenues products are now wholly developed by Mastek staff.

3. RELEVANT THEMES

The following have been identified as key themes in the investigation:

- **Project Team Organisation**

The Mastek teams are organised into offshore and onshore teams with the optimum structure being one third onshore two thirds offshore. The work taking place offshore tends to be pure programming work. The offshore team receive structured technical specifications which are compiled by the product manger and solution architect. Technical specification is sent to Bombay and the module leader distributes the work within the team. Code is written, reviewed. tested and subsequently returned to the UK where the solution architect will retest before beta testing at client site. A copy of the full module is kept on site by the offshore team.

- **Technology for team communication**

In order to communicate with Trowbridge and vice versa a 64 kbs leased line is in place which goes via the Mastek intranet to USA - ISP in USA to ISP in UK. The Mastek file server is outside the firewall so that Mastek Trowbridge can log on and pull down source codes via FTP / TELNET.

Staff use UNIX chat for synchronous discussion and telephone conferencing with a communications room at Bombay and Trowbridge for group discussion

- **The On shore Off shore Mix**

An attempt was made to move more staff off shore (the current balance is roughly 1/3 onshore with the rest in Bombay) which was unsuccessful. On average this meant 15 people per product, 5 in the UK and 10 in Bombay. An attempt was made to reduce the UK presence to 1 Mastek staff member per product. This was impossible due to the following reasons:

- level of workload in Trowbridge
- the need for local government expertise and understanding of the language of taxation and benefits
- time and availability of key staff in Bombay
- problems of retention of staff in Bombay one factor of which is due to an unpopular Ingres platform used by Academy.

- **Human Resource Development (HRD) Strategies at Mastek**

There is a comprehensive strategy for HR development at Mastek. The strategic deployment process indicates the thrust areas for the company which contain employee satisfaction at a high level in the organisation. Employees are known as "Mastekeers" and the stated goal is to "facilitate each member to full potential"
There are 3 cornerstones of HRD development:

- : performance management

- : training and development

- : career development

Performance management is concerned with the setting of KRAs (key result areas) which are facilitated by 6 monthly appraisal cycles and objectives passed down into departmental, self development and supervisory KRAs. Training and development aims to identify weaknesses of staff members and then link work experiences with weaknesses to improve whilst on the job. Staff are given a rating at the end of a year: performance related increment and an awards system is in place linked to performance management. Training and development takes place at level of individual and strategic business unit (SBU). Mastek are attempting to look at training at the company level indicating the core values of the company and how that can be understood by whole company. Career development provides a defined career path at Mastek from programmer to analyst, module leader, to project manager. Employees are encouraged to apply and move between assignments as far as possible within the constraints of their customers needs. This is often problematic as people need challenging work and if the platform is outdated they feel a sense of obsolescence very quickly. The USA is a major draw.

HR staff visit the UK every few months (Oct 97 was last visit) where she meets every Mastekeer face to face and keeps the contact going via email. The future of HRD is for every project manager to be an HR manager.

This HR model is for the project work at Bombay. Work on the client site uses a different arrangement and interaction is not as close. There is a desire to modify the HR structure to work offshore.

4. STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

Strengths

- A rigorous disciplined software development methodology enables cultural diversity to be overcome when working across time and distance. Work is to some extent "people independent". This alleviates the impact of high staff turnover rates in Mastek.

- Mastek software development methodology has enabled the bringing together of a coherent organisational ethos at Academy leading to improved project control and reduced error rates.

- Mastek views employee satisfaction at a strategic level.

- Indian software programmers are highly competent and well respected at Academy.

- Academy is profitable and competitive.

- Outsourcing of development work to Mastek has allowed Academy directors time for strategic issues and acquisitions.

Weaknesses

- An outdated platform used by Academy leads directly to a significant threat of attrition.

- Attrition is not helped by the repetitive monotonous nature of work in the software factory. One answer may be to move more work offshore involving problem solving and liaison with the customer using innovative communication technologies such as video conferencing . This is under trial in Mastek at present but it would expose Academy to greater risk.

- The structured HR function activities do not at present embrace Mastek employees on contract at client sites. This responsibility is left to the project manager.

- The structured software development method used is bureaucratic, slow and does not encourage creativity. It could be used as a vehicle for political protection in event of failure.

Opportunities

- A video conference facility is planned for the next few months at Mastek as ISDN is in place to Bombay. Videoconferencing is seen as important as a richer medium offering personal interaction conveying thoughts, explanations and the use of whiteboard for explaining concepts diagrammatically. The Mastek trial will commence with a pilot within a USA based organisation. Telecommunications improvements in India have improved substantially and a direct channel to USA is now inplace. A higher bandwidth link would be required to UK.

- There is a relationship between the onshore / offshore mix and the stage in the systems development lifecycle. As Academy products move into a maintenance phase, it is hoped that more staff could be moved offshore but this may be problematic due to retention issues.

- A move towards rapid application development is under consideration which will require careful control over on shore / offshore balance and retention problems.

- As Mastek becomes more closely integrated into Academy's business it is becoming steadily more involved in strategic issues. Closer integration of Mastek into the organisation by joint venture type arrangements may be an opportunity to ensure long term stability.

Threats

- Academy have developed a close relationship with Mastek which potentially poses a threat in the event of Mastek's liquidation.

- The Mastek attrition data indicates a high staff turnover. The recent resignation of a Bombay based team demonstrates the seriousness of this threat.

- Minimising attrition is crucial to Academy due to the large amount of specialist knowledge needed to work on UK taxation and housing systems. Retention of Mastek staff for Academy is problematic largely due to an unpopular platform which is not perceived by programmers as a leading edge. Mastek - Academy employee attrition falls into 3 main areas: movement within Academy module projects, movement within the company to other projects, movement to other organisations with a view to going to prime areas such as the USA. Most programmers rate platform as their first consideration in choosing to take or leave an assignment. Platforms such as Internet, Powerbuilder and graphical user interface design were quoted as the most marketable skills at present. Already a whole module team has moved away from Academy (& Mastek), they can be replaced but the learning curve is substantial causing interim difficulties and this poses a significant threat to Academy as the platform becomes more outdated.

- Academy cannot ignore this problem or allow the issue to rest solely with Mastek. As the platform becomes more outdated the supply of the highest quality staff is likely to become problematic. Effectively, Academy are competing to engage and retain the best Mastek staff in the face of competition from other projects, other Indian companies, USA etc.

6 FURTHER ANALYTICAL FOCUS

Research will continue on the themes described. It is hoped that this document will form a basis for discussion with Academy and Mastek staff. The planned one year timescale of research should allow for an analysis of changing relations over the period. It is hoped that further interviews can take place in the next few weeks.

Acknowledgements

BIBLIOGRAPHY

Ackoff, R. (1979) 'The future of operational research is past' J. Opl. Res. Soc. Vol. 30 pp. 93-104.

Ahituv, N. Hadass, M. and Neumann, S. (1984) 'A flexible approach to information systems development' MIS Quarterly. Vol. 8 pp 69-78.

Alias, R. (1997) A Multiple Perspectives Exploration Of Information Systems Quality in a Malaysian Context. Unpublished PhD Thesis. University Of Salford.

Allaire, Y. and Firsirotu, M. (1984) 'Theories of organisational culture' Organisation Studies. Vol. 5 (3) pp. 193-226.

Angell, I. and Straub, B. (1993) 'Though this be madness yet there is method in't' Journal Of Strategic Information Systems. Vol. 2 (1) pp. 5-14.

Apte, U. (1994) 'Globalization of information systems outsourcing: opportunities and managerial challenges' in Deans, C. and Jurison, J. (Eds.) Information Technology In A Global Business Environment. Boyd and Fraser. Massachusetts. pp. 307 - 322

Archer, S. (1988) 'Qualitative research and the epistemological problems of the management disciplines' in Pettigrew, A. Competitiveness and the Management Process. Blackwells. Oxford. pp. 265 302.

Attewell, P. (1987) 'Big brother and the sweatshop: computer surveillance in the automated office' Sociological Theory. Vol. 5 pp.87-89.

Avison, D. Wood-Harper, A.T. Vidgen, R. and Wood, J.R.G. (1996) 'Multiview 2: a further exploration in information systems development' in Proceedings Of BIT 96. Manchester Metropolitan University. pp. 295-304.

Avison, D. and Fitzgerald, G. (1988) Information Systems Development. Blackwell Scientific Publications. Oxford.

Avison, D. and Myers, M. (1995) 'Information systems and anthropology: an anthropological perspective on IT and organisational culture' IT and People. Vol. 8 (3) pp. 43-56.

Avison, D. and Wood Harper, A.T. (1990) Multiview: An Exploration In IS Development. Blackwell. Oxford.

Avison, D. and Fitzgerald, G. (1995) Information Systems Development: Methodologies Techniques and Tools. McGraw-Hill. Maidenhead.

Bachrach, P. and Baratz, M. (1970) 'Two faces of power' American Political Science Review. Vol. 56 pp. 947-952.

Barley, S. (1986) 'Technology as an occasion for structuring: evidence from observations of CT scanners and the social order of radiology departments'. Administrative Science Quarterly. Vol. 31 pp.78 - 108.

Barnatt, K. (1994) Cyberbusiness. Wiley. London.

Barrett, M. Hinings, C.R. Krishna, S. and Sahay, S. (1997) 'The process of building GSO relationships: the experience of a multi-national vendor with Indian contractors' Proceedings of International Conference On Information Systems. Atlanta, Georgia. Dec 14-17.

Barrett, M. Sahay, S. and Drummond, A. (1996) 'Exploring the impact of cross-cultural differences in international software development teams: Indian expatriates in Jamaica'. Proceedings of European Conference on Information Systems. Lisbon Portugal. July. pp. 347-356.

Baskerville, R. Travis, J. and Truex, D. (1992) 'Systems Without Method: The Impact Of New Technologies On Information Systems Development Projects' in

Kendall, K. et al (Eds.) The Impact Of Computer Supported Technologies On Information Systems Development. Elsevier. Holland. pp. 241-269.

Baskerville, R. and Wood Harper, A.T. (1996) 'A critical perspective on action research as a method for information systems research'. Journal of Information Technology. Vol. 11 pp.235-246.

Beck, U. (1992) Risk Society Toward a New Modernity. Sage. London.

Beer, S. (1981) Brain Of The Firm. Wiley. Chichester.

Bell, D. (1974) The Coming Of The Post-industrial Society: A Venture In Social Forecasting. Penguin. Harmondsworth.

Bell, F. and Oates, B. (1994) 'Framework for method integration' in Proceedings Of The Second Conference Of The British Computer Society Information Systems Methodologies Specialist Group. Edinburgh. pp. 39-50.

Birchall, D. and Lyons, L. (1996) Creating Tomorrow's Organisation. Pitman. London.

Boehm, B. (1976) 'Software engineering' IEEE Transactions On Computers. Vol. 25 pp. 1226-1241.

Boland, R. (1985) 'Phenomenology: a preferred approach to research on information systems' in Mumford, E. et al (Eds.) Research Methods In Information Systems. Elsevier. Amsterdam. pp. 193-201.

Boland, R. (1987) 'The in formation of information systems' in Boland, R. and Hirschheim, R. (Eds.) Critical Issues In Information Systems Research. Wiley. Chichester. pp. 363-379.

Boland, R. and Day, W. (1989) 'The experience of system design: a hermeneutic of organizational action' Scandinavian Journal Of Management. Vol. 5 (2) pp. 87-104.

Brady, J. (1977) The Theory Of Computer Science. Chapman and Hall. London.

Bullen, C. and Bennet, J. (1996) 'Groupware in practice: an interpretation of work
experiences' in Kling, R. (Ed) Computerisation and Controversy. Academic
Press. New York. pp. 348 - 382.

Burton Swanson, E. (1987) 'Information systems in organisation theory: A Review' in
Boland, R. and Hirschheim, R. (Ed) Information Systems Research. Wiley.
Chichester. pp. 181-204.

Carr, W. and Kemmis, S. (1986) Becoming Critical: Education, Knowledge and Action
Research. Falmer. London.

Castells, M. (1996) The Rise of the Network Society. Blackwell. Oxford.

Checkland, P. (1981) Systems Thinking Systems Practice. Wiley. Chichester.

Checkland, P. (1983) 'OR and the systems movement: mappings and conflicts' J.Opl.
Res. Soc. Vol. 34.

Checkland, P. (1988) 'Information systems and systems thinking: time to unite' in
Checkland, P. and Scholes, J. (1990) Soft Systems Methodology In Action
Wiley. Chichester.

Checkland, P. and Scholes, J. (1990) Soft Systems Methodology In Action Wiley.
Chichester.

Checkland, P. (1991) 'From framework through experience to learning: the essential
nature of action research' in Nissen, H. Klein, H. and Hirschheim, R. (Eds.)
Information Systems Research: Contemporary Approaches and Emergent
Traditions. North Holland. Amsterdam. pp. 397-403.

Churchman, C. (1979) The Systems Approach and its Enemies. Basic Books. New
York.

Clark, P. (1972) Action Research and Organisational Change. Harper and Row. London.

Clegg, S. (1979) The Theory Of Power and Organisation. Routledge and Kegan Paul. London.

Couger, D. (1986) 'Effect of cultural differences on the motivation of analysts and programmers: Singapore vs. USA' MIS Quarterly. Vol. 10 (2) pp. 189-196

Daft, R. and Lengel, R. (1984) 'Information richness: a new approach to managerial information processing and organisation design' in Staw, B. and Cummings, L. (Eds.) Research In Organisational Behaviour. Vol. 6. Jai Press. Connecticut. pp. 191-233.

Dahl, R. (1957) 'The concept of power' Behavioural Science. Vol. 2 pp. 201-215.

Davidow, W. and Malone M. (1992) The Virtual Corporation. Harper Collins. New York.

Davis, L. (1991) 'Researching the organisational culture contexts of information systems strategy: a case study of the British army' in Nissen et al (Eds.) Information Systems Research: Contemporary Approaches and Emergent Traditions. Elsevier. Holland. pp. 145-167.

De Marco, T. (1982) Controlling Software Projects: Management Measurement and Estimation. Prentice Hall. Englewood Cliffs.

De Riencourt, A. (1960) The Soul of India. Harper. New York.

Downs, E. Clare, P. and Coe, I. (1992) Structured Systems Analysis and Design Method: Application and Context. Prentice Hall. London.

Drucker, P. (1988) 'The coming of the new organisation' Harvard Business Review. Jan - Feb.

Dunlop, C. and Kling, R. (1991) Computerization and Controversy: Value Conflicts and Social Choices. Academic Press. San Diego.

Dustdar, S. and Hofstede, G. (1998) 'Videoconferencing across cultures: a conceptual framework for floor control issues' in Proceedings Of The 6th European Conference On Information Systems. Helsinki. Finland. pp. 333-347.

Easter Brook, S. Beck, E. Goodlet, J. Plowman, L. Sharples, M. and Wood, C. (1993) 'A survey of empirical studies of conflict' in Easterbrook, S. (Ed.) CSCW Co-Operation Or Conflict. Springer Verlag. London. pp. 1 -68.

Ehn, P. (1989) 'The art and science of designing computer artefacts' Scandinavian Journal of Information Systems, August, pp. 21-42.

Ein Dor, P. and Segev, E. (1992) 'The effect of national culture on IS: implications for international information systems' Journal Of Global Information Management. Vol. 1 (1) pp. 33-44.

Elden, M. and Chisholm, R. (1993) 'Emerging varieties of action research' Human Relations. Vol. 46 (2) pp.121-142.

Enns, H. Raman, K. and Watson, R. (1994) 'National culture, information systems and organisational implications' in Deans, C. and Karwan, K. (Eds.) Global Information Systems and Technology: Focus on the Organisation and its Functional Areas. Idea Group Publishing. Harrisburg. USA

Episkopou, D. and Wood - Harper, A.T. (1986) 'Towards a framework to choose appropriate is approaches' The Computer Journal. Vol. 29 (3) pp. 79-92.

Erez, M. and Earley, P. (1993) Culture Self Identity and Work. Oxford University Press. New York.

Espejo, R. and Watt, J. (1978) 'Management information systems: a system for design' Working Paper 98. University Of Aston Management Centre.

Fay, B. (1987) 'An alternative view: interpretive social science' in Gibbons, M. T. (Ed.) Interpreting Politics. New York University Press. pp. 82-100.

Feldman, M. and March, J. (1981) ' Information in organisations as signal and symbol'

Administrative Science Quarterly. Vol. 26 (2) pp. 171-186.

Fetterman, D. (1989) Ethnography Step By Step. London. Sage.

Fitzgerald, B. (1996) 'Formalised systems development: a critical perspective'

Information Systems Journal. Vol. 6 pp. 3-23.

Flood, R. and Carson, E. (1992) Dealing With Complexity: An Introduction To The

Theory And Application Of Systems Science. Plenum. New York.

Flood, R. and Jackson, M. (1992) Creative Problem Solving. Wiley. Chichester.

Foucault, M. (1979) Discipline and Punish. Vintage. New York.

Forester, J. (1992) 'Critical ethnography on field work in an Habermasian way' in

Alvesson, M. and Willmott, H. (Eds.) Critical Management Studies. Sage.

London. pp: 46-65.

Galliers, R. (1985) 'In search of a paradigm for information systems research' in

Mumford et al (Eds.) Research Methods In Information Systems. Elsevier.

Holland.

Galliers, R. (1991) 'Choosing appropriate is research approaches a revised taxonomy' in

Nissen et al (Eds.) IS Research : Contemporary Approaches and Emergent

Traditions. Elsevier. Holland.

Garfinkel, H. (1967) Studies in Ethnomethodology. New Jersey. Prentice Hall.

Gates, W. (1996) The Road Ahead. Penguin. New York.

Geertz, C. (1973) The Interpretation of Cultures. Basic Books. New York.

Giddens, A. (1984) The Constitution Of Society. Polity. Cambridge.

Giddens, A. (1990) Consequences Of Modernity. Blackwell. Oxford.

Giddens, A. (1991) Modernity and Self Identity. Polity. Cambridge.

Glaser, B. and Strauss, A. (1967) The Discovery Of Grounded Theory: Strategies For Qualitative Research. Aldine. Chicago.

Grudin, J. (1994) 'Groupware and social dynamics: eight challenges for developers' Communications of the ACM. Vol. 371 pp. 93-109.

Gupta, U. and Raval, V. (1999) 'Critical success factors for anchoring offshore projects' Information Strategy. Vol. 15 (2) pp. 21-27.

Hall, S. (1991) 'The local and the global: globalization and ethnicity' in A.D.King (ed.) Culture Globalisation and the World System. Macmillan. London.

Hall, W. (1995) Managing Cultures. Wiley. Chichester.

Handy, C. (1994) The Empty Raincoat. Hutchinson. London.

Handy, C. (1995) 'Trust and the virtual organisation' Harvard Business Review May-June pp. 40-50.

Hardy, C. (1985) 'The nature of unobtrusive power' Journal of Management Studies. Vol. 24 (4) pp. 384-399.

Harrison, W. and Farn, C. (1990) 'A comparison of information management issues in the USA and Republic of China' Information and Management. Vol.18 pp.177-188.

Harvey, D. (1989) The Condition Of Postmodernity. Blackwell. Oxford.

Heath, C. and Luff, P. (1991) 'Disembodied Conduct Communication Through Video In A Multimedia Office Environment' in Robertson, S. Olson, G. and Olson, J. (Eds.) Proceedings Of The Human Factors In Computing Conference. ACM. New York. pp. 99-103.

Heeks, R. (1995) 'Global software outsourcing to India by multinational corporations' in Palvia, P. et al (Eds.) Global Information Technology and Systems

Management: Key Issues and Trends. Ivy League Publishing. Nashua. pp.364-389.

Heeks R (1996) India's Software Industry State Policy Liberalisation and Industrial Development. Sage. London.

Herring, S. (1996) Computer Mediated Communication: Linguistic Social and Cross Cultural Perspectives. John Benjamins. Amsterdam.

Hirschheim, R. and Klein, R. (1994) Realising emancipatory principles in information systems development: The case for ETHICS. MIS Quarterly. Vol. 18 (1) pp. 83-109.

Hirschheim, R. and Newman, M. (1991) 'Symbolism and information systems development: myth metaphor and magic' Information Systems Research. Vol. 2 (1). pp. 29-62.

Hofstede, G. (1980) Cultures Consequences : International Differences in Work Related Values. Sage. Beverley Hills.

Hofstede, G. (1991) Cultures and Organisations. McGraw Hill. Maidenhead.

Hofstede, G. (1996) 'The Windmills Of The Mind' in Proceedings Of The International Office Of The Future: Design Options and Solution Strategies Conference. In Proceedings of IFIP Working Group 8.4. pp. 153-169.

Hofstede, G. (1997) 'Wired International Teams: Experiments In Strategic Decision Making By Multi Cultural Virtual Teams' in Galliers, R. et al (Eds.) Proceedings Of The 5th European Conference On Information Systems. Cork Publishing. pp. 321-336.

Howcroft, D. (1998) Spanning The Spectrum From Utopia To Dystopia: An Interpretive Field Study Of The Nature and Characteristics Of Internet Usage. Unpublished PhD Thesis. UMIST.

Hunter, M. and Beck, J. (1996) 'A cross cultural comparison of excellent systems analysts' Information Systems Journal. Vol. 6 pp. 261-281.

Introna, L. (1997) Management Information and Power. Macmillan. Basingstoke.

Jackson, M. (1991) Systems Methodology For The Management Sciences. Plenum. New York.

Jackson, M. (1992) 'An integrated programme for critical thinking in information systems research' Journal Of Information Systems Vol. 2 pp. 83-95.

Jayaratna, N. (1994) Understanding and Evaluating Methodologies. McGraw-Hill. Maidenhead.

Johansen, R. (1988) Groupware : Computer Support For Business Teams. Free Press. New York.

Johansen, R. (1995) Interview in Attacking The Organisation. BBC Radio 4.

Jones, M. (1999) 'Structuration theory' in Currie, W. and Galliers, R. (Eds.) Rethinking Management Information Systems. Oxford University Press. New York.

Kaplan, B. Duchon, D. (1988) 'Combining qualitative and quantitative methods in information systems research : A case study' MIS Quarterly. December. pp. 571-586.

Kaye, R. and Little, S. (1996) Global business and cross-cultural information systems' IT and People. Vol. 9 (3) pp. 30 - 54.

Kedia, B. and Bhagat. R. (1988) Cultural constraints on transfer of technology across nations: implications for research in international and comparative management' Academy of Management Review. pp. 559- 571.

Keittinger, W. Lee, C. and Lee, S. (1995) 'Global measures of information service quality: a cross national study'. Decision Sciences. Vol. 26 (5) pp.569-588.

Kern, T. and Silva, L. (1998) 'Mapping the areas of potential conflict in the management of information technology outsourcing' in Proceedings Of The European Conference On Information Systems. Helsinki. Finland. pp. 612-627.

King, W. and Sethi, V. (1993) 'Developing transnational information systems: a case study'. Information and Management. Vol. 21 (1) pp. 53-59.

Kinsman, F. (1992) The Telecommuters. Sage. London.

Klein, H and Hirschheim, R. (1991) 'Rationality concepts in information systems development methodologies' Accounting, Management and Information Technologies. Vol.1 (1) pp. 29-62.

Klein, H. and Myers, M. (1999) 'A set of principles for conducting and evaluating interpretive field studies in information systems' MIS Quarterly. Vol. 23 (1) pp. 67-93.

Kling, R. (1980) 'Social analyses of computing: theoretical orientations in recent empirical research' Computing Surveys. Vol. 12 (1) pp.61-110.

Kling, R. and Scacchi, W. (1982) 'The web of computing: computer technology as social organization' Advances in Computers. Vol. 21. pp. 1-90

Kronlof, K. (1993) Method Integration Concepts and Case Studies. John Wiley. Chichester.

Kuhn, T. (1970) The Structure Of Scientific Revolutions. University Of Chicago Press.

Kumar, K. and Bjorn Andersen, N. (1990) 'A cross cultural comparison of is designer values' Communications Of The ACM. Vol. 33 (5) pp.528-538.

Lacity, M. and Hirschheim, R. (1993) Information Systems Outsourcing: Myths Metaphors and Realities. Wiley. Chichester.

Lakoff, G. and Johnson, M. (1980) Metaphors We Live By. University Of Chicago Press.

Latour, B. (1996) Aramis Or The Love Of Technology. Harvard University Press. Cambridge.

Leavitt, H. and Whistler, T. (1958) 'Management in the 1980's' Harvard Business Review. November-December. pp.41-48.

Lee, A. (1994) 'Electronic mail as a medium for rich communication: an empirical investigation using hermeneutic interpretation' MIS Quarterly. Vol. 18 (2) pp.143-157.

Levinson, N. and Asahi, M. (1995) 'Cross national alliances and interorganisational learning' Organisational Dynamics. Vol. 24 (2) pp. 65-78

Lewis, P. (1994) Information Systems Development. Pitman. London.

Lucas, H. and Baroudi, J. (1994) 'The role of information technology in organisation design'. Journal Of Management Information Systems. Vol. 10 (4) pp. 9-23.

Lukes, S. (1974) Power: A Radical View. Macmillan. London.

Lyon, D. (1990) The Information Society: Issues and Illusions. Polity Press. Cambridge.

Lyytinen, K. and Klein, H. (1985) 'The critical theory of Jurgen Habermas as a basis for a theory of information systems' in Mumford, E.et al (Eds.) Research Methods in Information Systems. North - Holland. Amsterdam. pp. 219-36.

Lyytinen, K (1992) 'Information systems and critical theory' in Alvesson, M and Wilt, H. (Eds.) Critical Management Studies. Sage. London.

Macaulay, L. (1994) 'Co-operative requirements capture: control room 2000' in Jirotka, M. and Goguen, J. (Eds.) Requirements Engineering: Social and Technical Issues. Academic Press. London.

Maclaren, R. Hornby, P. Robson, J. O'Brien, P. Clegg, C. and Richardson, S. (1991) 'Systems design methods- the human dimension DTI Project IED/4/1249 London' Academy Of Management Review. Vol. 13 (4) pp. 105-133.

Madon, S. (1997) 'Information based global economy and socio economic development: the case of Bangalore' The Information Society. Vol. 13 pp. 227-243.

Mantovani, G. (1994) 'Is computer mediated communication intrinsically apt to enhance democracy in organisations?' Human Relations. Vol.47 (1) pp.45-62.

Markus, M. (1983) 'Power politics and MIS implementation' Communications Of The ACM. Vol. 26 (6) pp. 430-445.

Markus, M. and Bjorn Andersen, N. (1987) 'Power over users: its exercise by system professionals' Communications Of The ACM. Vol. 26 (6) pp. 430-445.

Markus, M. (1994) 'Finding a happy medium: explaining the negative effects of electronic communication on social life at work' ACM Transactions On Information Systems. Vol. 12 (2) pp. 119-149.

Martin, W. (1995) The Global Information Society. Gower. Aldershot.

Massey, D. (1995) Space, Place and Gender. Polity. Cambridge.

Maurer, R. (1996) Call For Papers IEEE Fifth Workshop On Enabling Technologies: Wet Ice Conference. Stanford University. June 19-21.

McFarlan, F. (1995) 'Issues in global outsourcing' in Palvia, P. Palvia, S. and Roche E. (Eds.) Global Information Technology and Systems Management: Key Issues and Trends. Ivy League Publishing. Nashua. pp.352-364.

McGrath, J. (1984) Groups: Interaction and Performance. Prentice Hall. Englewood Cliffs NJ.

McLuhan, M. (1964) Understanding Media: The Extensions Of Man. McGraw Hill. New York.

Middleton, P. (1994) 'Euromethod: the lessons from SSADM' in Proceedings Of The

Second European Conference On Information Systems.   Walter Beats

Breukelen. Nijenrode Holland. pp.226-235.

Miles, R. and Snow, C. (1986) 'Organisations: new concepts for new forms' California

Management Review. Vol. 28 (3) pp.62-73.

Miles, R. (1988) 'Combining soft and hard systems practice: grafting or embedding?'

Journal Of Applied Systems Analysis. Vol. 15 pp. 55-60.

Mingers, J. (1996) 'Combining research methods in information systems: multi

paradigm methodology in distributed organisations: experiences from four

implementation teams' in Proceedings Of The 5th European Conference On

Information Systems. Cork. Ireland. pp. 760 776.

Minoli, D. (1995) Analyzing Outsourcing: Reengineering Information and

Communication Systems. Mc Graw Hill. Maidenhead.

Mitroff, I. (1983) Stakeholders of the Organisational Mind. Jossey Bass. San Francisco.

Miranda, S. (1996) 'Instituting process change to support effective telecommuting'

Proceedings of BIT 96. Manchester Metropolitan University. pp. 323-330.

Morgan, G. (1986) Images Of Organisation. Sage. London.

Morgan, G. (1993) Imaginization. Sage. London

Mowshowitz, A. (1994) 'Virtual organisation a vision of management in the

information age' The Information Society. Vol.10 pp.267-288.

Mumford, E. (1983) Designing Human Systems. Manchester Business School.

Mumford, E. (1994) 'Technology communication and freedom: is there a relationship?'

in Baskerville, R. Smithson, S. Ngwenyama, O. and Degross, J. (Eds.)

Transforming Organisations With Information Technology. Elsevier Science.

Holland.

Munkvold, B. (1997) 'Challenges of IT implementation for supporting collaboration in distributed organisations: experiences from four implementation teams' in Proceedings Of The 5th European Conference On Information Systems. Cork. Ireland. pp. 481 496.

Myers, M. (1994) 'A disaster for everyone to see. An interpretive analysis of a failed IS project'. Accounting Management and Information Technology. Vol. 4 pp.185-201.

Myers, M. (1997) 'Interpretive research in information systems' in Mingers, J. and Stowell, F. (Eds.) Information Systems: An Emerging Discipline? McGraw Hill. London. pp. 239-266.

Myers, M. and Young, L. (1997) 'Hidden agendas, power and managerial assumptions in information systems development'. IT & People. Vol. 10 (3) pp. 224-240.

Nagel, J. (1975) The Descriptive Analysis Of Power. Yale University Press.

Naipaul, V. (1964) An Area of Darkness. London. Andre Deutsch.

NASSCOM (1998) National Association Of Software and Service Companies Press Release July.

Negroponte, N. (1995) Being Digital. Coronet. London.

Nelson, R. Weiss, L. and Yamazaki, K. (1992) 'Information resource management within multinational corporation' International Information Systems. Vol. 1 (4) pp. 57-88.

Ngwenyama, O. (1991) 'The critical social theory approach to information systems: problems and challenges' in Nissen, H.E, Klein, H.K. and Hirshheim, R. (Eds.) Information Systems Research Contemporary Approaches and Emergent Traditions. Elsevier Science Publishers. New York. pp. 267-80.

Ngwenyama, O. and Lee, A. S. (1997) Communication richness in electronic mail: critical social theory and the contextuality of meaning' MIS Quarterly. Vol. 21 (2) pp. 145-167.

Nicholson, B. (1995) 'The critical information systems practitioner: listening to the babble of voices?' in Ellis, K. et al (Eds.) Critical Issues In Systems Theory and Practice. Plenum. New York.

Nilles J. (1998) Managing Telework: Strategies for Managing the Virtual Workforce. Wiley. Chichester.

Ogilvie, H. (1994) 'This old office' Journal Of Business Strategy. Vol. 15 (5) pp. 26-30.

Ohmae, K. (1994) The Borderless World. Sage. London.

Oliga, J. (1991) 'Methodological foundations of systems methodologies' in Flood, R. and Jackson, M. Critical Systems Thinking: Directed Readings. Wiley. Chichester.

Orlikowski, W. (1992a) 'Organisational issues in groupware implementation' in Proceedings Of The Conference On Computer Supported Co-operative Work. ACM. New York. pp. 75-84.

Orlikowski, W. (1992b) 'The duality of technology: rethinking the concept of technology in organisations' Organisation Science. Vol. 3 (3) pp.398-427.

Orlikowski, W. and Baroudi, J. (1991) 'Studying IT in organisations: research approaches and assumptions' Information Systems Research. Vol. 2 (1) pp.1-28.

Paton, G. (1993) 'Linking SSM with VSM for information systems management' in Stowell, F. et al (Eds.) Systems Science. Plenum. New York.

Peters, T. and Waterman, R. (1982) In Search Of Excellence. Harper and Row. New York.

Peters, T. (1995) The Pursuit of Wow! Vintage. New York.

Pettigrew, A. (1979) 'On studying organisational cultures' Administrative Science

Quarterly. Vol. 24 pp. 570-581.

Pettigrew, A. (1985a) 'Contextualist research: a natural way to link theory and practice'

in Lawler, E. et al (Eds.) Doing Research That Is Useful For Theory and

Practice. Jossey Bass. San Francisco.

Pettigrew, A. (1985b) The Awakening Giant: Continuity and Change in ICI. Oxford.

Blackwell.

Pettigrew, A. (1987) 'Context and action in the transformation of the firm' Journal Of

Management Studies. Vol. 24 (6) pp. 649-670.

Pettigrew, A. (1990) 'Longitudinal field research on change: theory and practice'

Organization Science. Vol.1 (3) pp.267-292.

Pfeffer, J. (1981) Power In Organisations. Pitman. Massachusetts.

Philips, E. and Pugh, D. (1992) How To Get a PhD. Open University Press. Bristol.

Radhakrishnan, S. (1993) The Hindu View of Life. New Delhi. Indus.

Ramsower, R. (1982) Telecommuting: The Organisational and Behavioural Effects Of

Working At Home. UMI Research Press.

Rangan, S. (1999) 'Seven myths to ponder before going global' Financial Times

Mastering Strategy. November 29.

Read, K. (1965) The High Valley. Charles Scribner's Sons. New York.

Rice, R. (1991) 'Computer mediated communication: a recursive review' in Lea, M.

(Ed.) Contexts Of Computer Mediated Communication. Harvesterwheatsheaf.

London. pp. 113-144.

Rittel, H. and Webber M. (1974) 'Dilemmas in a general theory of planning' in Systems

and Management Annual. Petrocelli. New York.

Ritzer, G. (1995) The McDonaldisation Of Society. Sage. California.

Robertson, R. (1992) Globalization Social Theory and Global Culture. Sage. London.

Robey, D. and Azvedo, A.(1994) 'Cultural analysis of the organisational consequences

of information technology' Accounting Management and Information

Technology. Vol. 4 (1) pp. 23-37.

Robey, D. and Rodriguez Diaz, A. (1989) 'The organisational and cultural context of

systems implementation: case experience from Latin America' Information and

Management. Vol. 17 pp. 229-239.

Roland, A. (1984) 'The self in India and America' in Kavolis, V. (Ed.) Designs Of

Selfhood. Associated University Press. New Jersey.

Romm, C. (1996) 'The office tyrant; abuse of power through e-mail' in Proceedings Of

The International Office Of The Future: Design Options and Solution

Strategies Conference. IFIP. University Of Arizona. pp.

Rudy, I. (1996) 'A critical review of research on electronic mail' European Journal Of

Information Systems. Vol. 4 pp. 198-213.

Saha, A. (1990) 'Traditional Indian concept of time and its economic consequences'

International Journal of Sociology and Social Policy. Vol. 10 (7) pp. 57 -79.

Saha, A. (1992) 'Basic human nature in Indian tradition and its economic consequences'

International Journal of Sociology and Social Policy. Vol.12 (1) pp.1-50.

Sahay, S. (1997) 'Implementation of information technology: a time-space perspective'

Organisation Studies. Vol.18 (2) pp. 229-260.

Sahay, S. and Walsham, G. (1997) 'Social structure and managerial agency in India'

Organisation Studies. Vol. 18 (3) pp. 417 - 443.

Sahay, S. (1998) 'Implementing GIS technology in India: some issues of time and space'. Accounting, Management and Information Technologies. Vol. 8 pp. 147-188.

Sahay, S. (1999) Personal communication with the author.

Schein, E. (1985) Organisational Culture and Leadership. Jossey Bass. San Francisco.

Scholte, B. (1972) 'Toward a reflexive and critical anthropology' in Hymes, D (Ed.) Reinventing Anthropology. Random House. New York .

Schon, D. (1983) The Reflective Practitioner - How Professionals Think In Action. Basic Books. New York.

Schumann, W. (1990) 'Strategy for information systems in the film division of Hoechst AG' Systems Practice. Vol. 3 (3) pp. 265 - 288.

Segars, A. Grover, V. and Durand, D. (1994) 'Organisational practice, information resource deployment and systems success: a cross cultural study' The Journal of Strategic Information Systems. Vol. 3 (2) pp. 85-106.

Senge, P. (1990) The Fifth Discipline. Random House. London.

Shore, B. and Venkatachalam, A. (1995) 'The role of national culture in systems analysis and design' Journal Of Global Information Systems Management. Vol. 3 (3) pp. 5-14.

Short, J. Williams, E. and Christie, B. (1976) The Social Psychology Of Telecommunications. Wiley. London.

Simon, H. (1976) Administrative Behaviour. The Free Press. New York.

Singh, J. (1990) Managerial culture and work related values in India, reply and comment' Organisation Studies. Vol. 11 (1) pp. 75-106.

Sinha, D. (1988) 'Basic Indian values and dispositions in the context of national development' in Sinha, D. and Kao, H. (Eds.) Social Values and Development: Asian Perspectives. Sage. New Delhi. pp. 31-55.

Sinha, J. and Sinha, D. (1990) 'Role of social values in Indian organizations' International Journal Of Psychology. Vol. 25 pp.705-714.

Smircich, L. (1983) 'Concepts of culture and organisational analysis' Administrative Science Quarterly. Vol. 28 (3) pp.339-358.

Sproull, L. and Kiesler, S. (1986) 'Reducing social context cues: electronic mail in organisational communication' Management Science. Vol. 32 (11) pp.1492-1512.

Sproull, L. and Kiesler, S. (1991) Connections New Ways Of Working In The Networked Organisation. MIT Press. Cambridge. Massachusetts.

Steinfield, C. and Fulk, J. (1990) 'The theory imperative' in Fulk, J. and Steinfeld, C. (Eds.) Organisations and Communication Technology. Sage. London. pp.13-25.

Stowell, F. and West, D. (1995) 'Does information systems need systems?' in Ellis, K. et al (Eds.) Critical Issues In Systems Theory and Practice. Plenum. New York.

Straub, D. (1994) 'The effect of culture on it diffusion: email and fax in Japan and the US' Information Systems Research. Vol. 5 (1) pp. 23-45.

Suchman, L. (1987) Plans and Situated Actions: The Problem Of Human-Machine Communication. Cambridge University Press. Cambridge.

Terdiman, R. (1999) Offshore Programming: What Cultural Differences Exist? Gartner Consulting Group Report. Available at http://www.gartner.com.

Tomlinson, J. (1994) 'A phenomenology of globalization? Giddens on global modernity' European Journal of Communication. Vol. 9 pp. 149-72.

Toffler, A. (1980)The Third Wave. Collins. London.

Trist, E. (1981) The Evolution Of Socio Technical Systems. Ontario Ministry Of Labour.

Ulrich, W. (1983) Critical Heuristics Of Social Planning. Haupt Berne.

Urry, J. (1991) 'Time and space in Giddens social theory'. in Bryant C. and Jary D Giddens Theory Of Structuration. London. Routledge.

Walsham, G. (1993) Interpreting Information Systems In Organisations. Wiley. Chichester.

Walsham, G. (1994) 'Virtual organisation: an alternative view' The Information Society. Vol. 10 pp. 289-292.

Walsham, G. and Waema, T. (1994) ' Information systems strategy and implementation: a case study of a building society' ACM Transactions on Information Systems. Vol. 12 (2) pp. 150-173.

Walsham, G. (1995) 'Interpretive case studies in IS research: nature and method' European Journal Of Information Systems. Vol. 4 (2) pp. 74-81.

Walsham, G. (1998) 'IT and changing professional identity: micro studies and macro theory' Journal Of American Society For Information Science. Vol. 49 (12) 1081-1089.

Walsham, G. and Sahay, S. (1999) 'GIS for district-level administration in India: problems and opportunities' MIS Quarterly. Vol. 23 (1) pp. 39-65.

Walther, J. (1992) 'Interpersonal effects in computer mediated interaction: a relational perspective' Communication Research. Vol. 19(1) pp.52-90.

Wastell, D. (1996) 'The fetish of technique: methodology as a social defence' Information Systems Journal. Vol. 6 pp. 25-40.

Watson, H. and Wood Harper, A.T. (1995) 'Deconstructing concepts interpreting

methodology' Journal Of Information Technology. Vol. 11 (1) pp. 36-51.

Whittington, R. (1992) 'Putting Giddens into action: social systems and managerial

agency' Journal Of Management Studies. Vol. 29 (6) pp.693-711.

Willcocks, L. Fitzgerald, G. and Feeny, D. (1995) 'Outsourcng IT: the strategic

implications' Long Range Planning. Vol. 28 (5) pp. 281-293.

Willcocks, L. and Kern, T. (1997) 'IT outsourcing as strategic partnering: the case of

the UK inland revenue' in Proceedings Of The 5th European Conference On

Information Systems. Cork. Ireland. pp. 470 1489.

Williamson, O. (1975) Markets and Hierarchies. The Free Press. New York.

Wilson, F. (1995) 'Managerial control strategies within the networked organisation'

Information Technology and People. Vol. 8 (3) pp. 57-72.

Wilson, F. (1997) 'The truth is out there: the search for emancipatory principles in

information systems design'. Information Technology & People. Vol.10 (3) pp.

187-204.

Winner, L. (1977) Autonomous Technology: Technics - Out - Of - Control As A

Theme In Political Thought. MIT Press. Cambridge. Massachusetts.

Winograd, T. (1988) 'A language / action perspective on the design of co-operative

work' Human Computer Interaction. Vol. 3 (1) pp. 3-30.

Winograd, T. and Flores, F. (1986) Understanding Computers and Cognition. Addison

Wesley. New York.

Wolf, D. (1991) The Rebels: A Brotherhood Of Outlaw Bikers. University Of Toronto

Press.

Wood Harper, A.T. (1989) Comparison of Information Systems Definition

Methodologies: An Action Research Multiview Perspective. Unpublished PhD

thesis. University of East Anglia.

Wood Harper, A.T. and Fitzgerald, G. (1982) 'A taxonomy of current approaches to

systems analysis' The Computer Journal. Vol. 25 (1) pp. 87-95.

Yeung H. (1998) 'Capital, state and space: contesting the borderless world' Transaction

of the Institute of British Geographers. Vol. 23 pp.291-309.

Yin, R. (1989) Case Study Research Design and Methods. Sage. London.

Zuboff, S. (1988) In The Age Of The Smart Machine. Basic Books. New York.