# Chapter 4

# Radicalised modernity and new technologies

"***Time, space, and causality are only metaphors of knowledge, with which we explain things to ourselves.***"

Friedrich Nietzsche, Samtliche Werke: Kritische Studienausgabe,
vol. 7, p. 484, selection 19[210],
eds Giorgio Colli and Mazzino Montinari, Berlin, de Gruyter (1980)

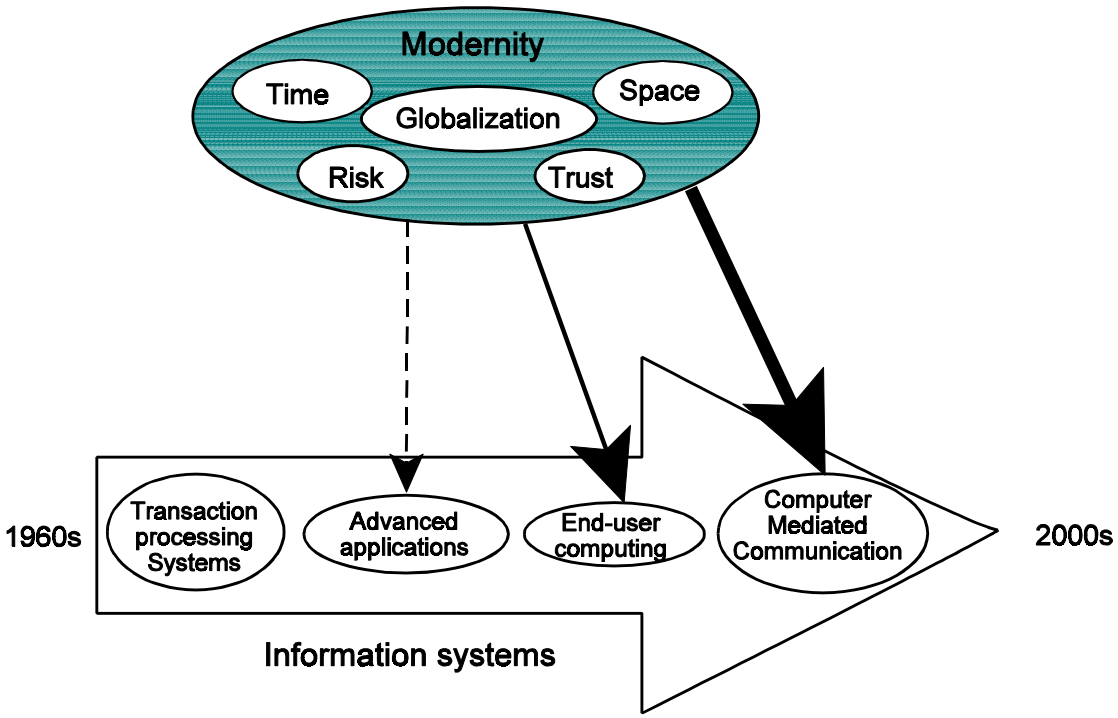


**Figure 4.1: The influence of Modernity on Information Systems**

# 4.1 Introduction

This is the last chapter in which the theoretical basis for the thesis is developed. Both Giddens and Habermas discuss the influence of the society in which we live on technology and the influence of technology on society. In this chapter these social philosophers will be referred to in order to obtain a critical perspective of technology, seeing it not only in the light of the advantages that it brings materially to some segments of society but also the less obvious disadvantages. The role of Information Technology in reducing the limitations of time and space on the way people interact is particularly interesting and Giddens' ideas on the impact of modernity on time and space and the related ideas of risk and trust will be studied. Habermas' critique of modernity in relation to communications media and the World Wide Web is also studied in accordance with the stated intention to view technology critically.

Different kinds of information systems have been developed at different times. This depended not only on the powerfulness of the existing technology but also on an emerging understanding of the different roles that information plays in an organisation and the relative importance of these. The first computer systems were centralised, batch processing systems that were limited to transaction processing and were bureaucratic. These systems were limited in scope in terms of time, space, usefulness and usability. These systems automated activities and used highly-structured, simple data types and data. The systems created over the last fifteen years are much more accommodating and have a far wider sphere of influence, either because they are tools developed in one place but used universally, or because they run on global networks. Therefore they reach across space and simultaneously almost eliminate time differences. These systems frequently use data such as text documents, which are not structured in the same way that data files used to be.

One sector of these advanced technologies, computer-mediated communication, and the Internet in particular is particularly relevant to this thesis and hence will be studied in this chapter and in greater depth in Chapter 5. This contributes directly to the research topic of this thesis, namely how effectively meaning can be shared by virtual teams who are communicating complex and equivocal information via e-mail.

## 4.2 The Information Age

It has become popular to divide the history of the world into a sequence of ages and each key note speaker seems to have a new and enlightening division. Often these are based on they way information is communicated. Hence, the eras are demarcated by the development of a written language, the printing press, electronic communication (morse code, telephone, radio and television) and "The Information Age" in which computer technology plays a large part. The society in which we live in the later part of the 20$^{th}$ century and now in the 21$^{st}$ century is, therefore, commonly characterised by the importance of information in it. We expect news to be relayed instantly and most people prefer means of communication that allow fast response (such as telephone, e-mail and using online ordering systems), to traditional, paper-based, means (such as letters, memos, reports and mail order). These recent forms of information systems underpin the whole phenomenon of globalization and as a result, have shaped our modern world.

> "*Globalization can be defined as the intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa.*" [Giddens, 1990: 64]

The previous chapter was devoted to a detailed discussion as to what data, information and meaning are. Despite the depth of the discussion, it was restricted to fairly traditional points of view. In particular, the role of technology in adding value to information was limited. In this chapter, attempts which have been made to extend that role will be examined, but first some aspects of modernity and post-modern society (also referred to as radicalised modernity or late modernity) and the structural duality which involves the influence of technology on modern society and modern society on technology will be discussed. In doing so, I will refer particularly to issues that Giddens and Habermas have highlighted. This chapter will focus on the role that both time and place play in modern information systems.

More advanced Management Information Systems and entirely new forms of technological support for all levels of employees, are discussed very briefly in Section 4.4 of this chapter. This is done in order to illustrate why the definition of basic terms in Information Systems is undergoing subtle, and frequently unacknowledged change. The changes in how the terms are defined reflect a change in emphasis in the role of information systems.

## 4.3 Giddens' view of Modernity

### 4.3.1 Introduction

The history of social organisation can be divided into eras according to how the majority of the people earned their living at that time. Hunters and gatherers were followed by crop growers and pastoral communities. Most recently society has been industrialised and dominated by capitalism. The modern era (or modernity) began in 16$^{th}$ century Europe and introduced this industrialised society. Modernity is characterised by a fundamental change in popular beliefs. Pre-modern society was dominated by tradition, religion, and superstition, and hence, virtually everyone believed that outside forces (religious, magic, and human authority) controlled their destiny. Members of modern society, on the other hand, began to believe that there are identifiable, scientific reasons for phenomena that had previously been ascribed to the will of the gods. Thus, they began to believe that the individual could influence, if not control, his own destiny, and began to question existing customs and traditions. This gave rise to a reflexive society, one which recognised that the actions of individuals and groups have consequences, some of which may be unintended. In a reflexive society people monitor the results of their own actions, try to analyse why these have had previously unforeseen consequences and deliberately try to affect the future. As a result, modern society is far more future oriented than traditional society was, as we try to predict consequences and foresee the future. Modern man lives in the future rather than the past.

> "*... social reflexivity refers to a world increasingly constituted by information rather than pre-given modes of conduct. It is how we live after the retreat of tradition and nature, because of having to take so many forward-oriented decisions.*" [Giddens & Pierson, 1998: 115]:

Giddens identifies the following characteristics of modern societies:

- Attitude: open to transformation by human intervention
- Economics: market economy and industrialisation
- Political institutions: nation-state mass democracy [Giddens & Pierson, 1998: 94]

Pre-modern society tended to be quite static, changing slowly, but modern society is changing all the time and the pace of change seems to accelerate and the effects increase in scope. The rapid progress in science and technology is a result of the enquiring nature of modernity and also feeds the cycle of change. There are, however, other causes as well.

Giddens says that authors influenced by Marx consider capitalism to have been the sole factor determining modernity, "*The restless, mobile character of modernity is explained as the outcome of the investment-profit-investment cycle which, combined with the overall tendency of the rate of profit to decline, brings about a constant disposition for the system to expand*" [Giddens, 1990: 11]. He believes that, although this has been important, other elements have also contributed.

> "*The dynamic forces of modernity [*are]*... the expansion of capitalism, the transformative effects of science and technology, the expansion of mass democracy.*" [Giddens & Pierson, 1998: 117]

It seems that capitalism could be a basic cause which continues to feed the cycle; science and technology enable the dynamic nature of society but also perpetuate it (the duality of structure) and mass democracy allows more people to participate and hence, intensifies it. Rationalised organisations tend to be more dynamic than more traditional ones because the management is reflexive. The organisations incorporate formal systems that are designed to provide constant and rapid feedback and hence allow them to be monitored. This results in more adjustments which affect the functioning of the organisation and encourage innovation.

Giddens notes four forces or basic dimensions which are reflected in various aspects of modernity, namely,

- The economic order - capital accumulation in the context of competitive labour and product markets;
- An industrial-technological base resulting in the development of the "created environment";

- Military power - control of the means of violence in the context of the industrialisation of war;
- Administrative power - control of information and social supervision.

### 4.3.2 The relationship between modernity and information

Information plays several roles in modern society which can be linked to Giddens' model of modernity. Firstly, it is a resource contributing to administrative power.

> "*But modern society also involves the formation of a distinctive kind of state and, more generally, distinctive kinds of organization. These depend essentially upon the structuring of information. That is why I use the idea of 'surveillance' ... as the way in which information systems are constructed to form new systems of administrative power.*" [Giddens, 1990: 96]

But, secondly, it is also essential to the increasingly reflexive nature of society as noted above. Here it is in the form of feedback, as we use the results of previous actions in deciding what our future actions should be. A third role is that which information systems have played in the industrial and scientific mastery of nature, or humanly engineered progress, in commercial and industrial systems and in the military. This is where there has been immense growth in the formal body of knowledge that we attempt to transfer to the next generation of experts in any field. As noted in Section 4.1, global information systems form the basis of globalization. In Table 4.1 the characteristics which Giddens identified as applying to modernity, factors determining the dynamic nature of modernity and the institutional dimensions which he associated with modernity, are linked to information requirements.

Science and technology have become an inseparable part of modern society but have also had an enormous and potentially catastrophic impact on the natural world. It is the pace of change and the recognition that much of that change may ultimately be disastrous that has given rise to post-modern philosophies and what Giddens refers to as reflexive modernity and as radicalised modernity. He explains this as follows,

> *"...we have moved through modernity from a 'simple' to a more 'reflexive' mode... Reflexive modernization says something about late modernity, reflecting on the limitations and difficulties of modernity itself."* [Giddens, 1990: 116]

**Table 4.1: Relationship between modernity and information**

| Modernity | | Role of Information |
|---|---|---|
| Character-istics | *Attitude: open to transformation by human intervention* | Active participation which intends to bring about change requires accurate, reliable information. |
| | *economics: market economy and industrialisation* | Market oriented economies need feedback from the market. Industrialised society needs to be efficient. Thus, information, at least at operating level, is required for industrialisation. |
| | *political institutions: nation-state mass democracy* | Democratic societies should make information freely available to all. |
| | *future oriented* | Predictions and forecasts need to be based on information about the present. |
| | *reflexive* | Feedback is essential in order to monitor current performance and detect unexpected consequences (error detection and correction). |
| | *Risk taking* | Modern institutions (military, industrial, economic) recognise the need to take risks but need to evaluate the extent of the risk ("risk management systems"). Manufactured risk needs to be monitored continually. Individuals should be informed about personal risk - health warning on cigarettes, lists of constituent ingredients on processed foods. |
| Factors determining the dynamic nature of modernity | *the expansion of capitalism* | Financial information. Investment decisions rely on almost instantaneous information. |
| | *the transformative effects of science and technology* | Science and technology create new information leading to new knowledge but are also founded on new input data and feedback from existing systems. |
| | *the expansion of mass democracy* | Democratic societies should make information freely available to all. |

| **Modernity** | | **Role of Information** |
|---|---|---|
| Dimensions of modernity | *the economic order - capital accumulation in the context of competitive labour and product markets;* | Market oriented economies need feedback from the market. Competition feeds the need for information about competitors and about new products and services (opportunities) and about existing costs. |
| | *an industrial-technological base resulting in the development of the "created environment";* | Information allows the efficient operation of this sector but also information regarding "manufactured risk" is needed. |
| | *military power - control of the means of violence in the context of the industrialisation of war;* | Military intelligence is particularly important in modern warfare. |
| | *administrative power - control of information and social supervision* | By definition this is based on information. |
| Time | fast | Fast reaction depends on continual input of information. |
| Space | global | Globalization requires global information systems. |
| Personal relationships | open, honest, voluntary, temporary, materialistic | New intimacy expects an open exchange of personal information. |

Modern technology and industrialisation has resulted in

> *" ... the increasing erosion of tradition and nature. The radicalization of modernity means being forced to live in a more reflexive way, facing a more open and problematic future. "*
> [Giddens, 1990: 116]

The so-called Information Age corresponds with radicalised modernity. The need for information is caused by the reflexivity of this society. The globally integrated character together with the reaction to that globalization, sometimes in the form of backlash, reinforces the need for ways of

exchanging information in an effective way. Radicalised modernity requires information but is also encouraged and extended by the information technology.

### 4.3.3 Time and space

Giddens interweaves concepts of time and space in much of his writing and these seem to play at least two roles. Firstly, there is the concept of the emptying of time and space. This refers to formalising measurement and the scientific character that the measurement of time and space has acquired [Giddens, 1990: 20]. In pre-modern times both time and space had a very personal and quite imprecise character. For example, a working day's duration depended on the season, distance was measured by the length of time it took to walk from one place to the other and the size of a piece of ground might be estimated by how many people (or cattle or trees) there were on it. Once clocks, and particularly portable clocks, were developed the concept of time was fundamentally altered. The universal reference to a standard time, and the separation of time from an exact relationship of the location to the sun have been relatively recent changes. (Now it is 8:00 at all locations in South Africa at precisely the same time, although the country is both wide and long and hence, according to the clock the sun rises at noticeably different times in Pretoria and Cape Town, and in Uppington and Durban, but this has not always been the case.)

Why is this relevant? Firstly, it has affected the control that individuals have over themselves and nature, as it has allowed mankind to see things from a more objective perspective. This has permitted complex organisation and co-ordination of events to the level of split second timing, and this is used to measure the efficiency of our organisations and production. Our society is extremely aware of time and very impatient. Hence, fast response time has become a significant competitive advantage. This rate of response has become both an advantage and disadvantage (instant gratification versus "the rat race"). The scientific control over time and space has resulted (and been the result of) a stretching of human horizons quite literally as it allows exploration, leading to routine travel and ultimately the exploration of outer space.

Secondly, people who are separated both by distance and time, have a profound influence on each other at a personal level but also at the level of the organisation and national economy. This has influenced how we communicate, the kinds of relationships that we consider normal, the kinds of organisations that we accept and the ways in which we manage them. The "distanciation of time and space" might sound as though it means that time and space are divorced from one another, or are independent, but it actually means that people separated by distance may still be in synchronous communication or may have a very real influence over each other. Giddens defines the concept as, "... *time-space distanciation - the conditions under which time and space are organised so as to connect presence and absence*" [Giddens, 1990: 14]. This is explained further as resulting in "...*complex relations between local involvement*

*(circumstances of co-presence) and interaction across distance (the connections of presence and absence)*" [Giddens, 1990: 14].

### 4.3.4 The relationship between time, space and information technology

One aspect of time-space distanciation is referred to by Giddens as the embedding and disembedding of expert systems. (Note that this use of the term "expert system" differs substantially from, and is much broader than, the term referring to a computer system that has a knowledge-base and substitutes for a human expert.) Technology allows essentially human activities to be captured in the form of procedures, bureaucratic systems, and computer systems and to be replicated and introduced in standard forms in otherwise dissimilar environments. Systems, labour and culture can be transferred by this process of disembedding. Labour located at the original site will be used during the creation of the expert system and the culture of that origin will permeate the system. But labour, culture and existing systems at the points where the system is embedded will be made redundant. This is one of the most noticeable effects of globalization. Standard, embedded systems have replaced the unique systems which were saturated with their local cultural influences. Automated production lines have replaced handcrafts.

> "*... locales are thoroughly penetrated by and shaped in terms of social influences quite distanced from them. What structures a locale is not simply that which is present on the scene; the 'visible form' of the locale conceals the distanciated relations which determine its nature.*" [Giddens, 1990: 19]

The organisation and coordination of systems, and embedded and disembedded expert systems, both influence and are influenced by our modern attitudes towards time and space. The most dramatic changes in lifestyles over the last decade are associated with technologies that bridge time and space, such as mobile telephones and the Internet. These are, however, simply the most recent and most extreme examples of the way in which common social behaviour has been affected, with respect to time and space, by technology. Many businessmen now travel long distances by air as part of a weekly routine. The goal of many online, embedded systems (not always realised) has been to significantly reduce the amount of time the average person spends standing in queues at shops and banks. Delays of a week or more that would previously have been accepted as normal, such as in acknowledgement of the receipt of a job application, are now reduced to seconds via e-mail. A significant number of people work from home and are rarely in the same place as either co-workers or clients. Software throughout a globalized organisation can be updated simultaneously. Computerised information systems are essential to, and integrated with, most of these events.

> "*The dynamism of modernity derives from the separation of time and space and their recombination in forms which permit the precise time-space 'zoning' of social life; the disembedding of social systems (a phenomenon which connects closely with the factors involved in time-space separation); and the reflexive ordering and reordering of social relations in the light of continued inputs of knowledge affecting the actions of individuals and groups.*" [Giddens, 1990: 17]

### 4.3.5 Trust and risk

> "*Trust and risk again concern the topic of time and space - they are both ways of organizing future time*" [Giddens & Pierson, 1998: 100]

> "*Trust ... can be a means of coping with risk, while acceptance of risk can be a means of generating trust.*" [Giddens & Pierson, 1998: 102]

Trust and risk are closely associated with each other and are relevant to situations where outcomes are not totally predictable and it is impossible to control the situation entirely. The more we move away from the stable, well-known, security of tradition, opting instead for the uncertainty of modern society, where we are required to make decisions based on our own judgement, the more we are forced to embrace risk and trust others.

#### 4.3.5.1 Trust

One of the main ways of building trust is by providing information. Hence, the length of time that people have known each other will help to determine the degree of trust. The more open people are, the more they can identify with one another, and hence, learn to trust one another. This would imply that an information-rich society would be a trusting society. This unfortunately is not the case and must say something about the type or quality of the information. People are increasingly required to place their trust in technology and disembedded systems, rather than trusting people or their own senses, as they would when working directly with the machinery that has traditionally been used to do the work. Zuboff [1984] in her case studies in "In the Age of the Smart Machine" discusses the problems that people who previously worked directly with the product and machinery have when they now work with new technology:

> *"They haven't learned to trust the machine to tell them what to do. This trust does not come naturally. It will only come when they really understand how it works.*" [Zuboff, 1984: 80]

Classically, computer systems have been used to try to improve predictions and increase control. This is not the intention of more recent systems which span space and time, such as those used in computer-mediated communication, as they involve end-users and other participants who are not only separated physically but may be in different time zones and are never in the same office at the same time. Such systems embrace risk and accept that prediction and control over the system environment are not entirely feasible. The system is more open and subject to unforeseen and to uncontrollable influences than before. Hence, a large degree of trust is needed.

Dahlbom and Mathiassen [1995: 14-20] discriminate between computer systems that are bureaucratic (where decisions are made strictly according to rules - for example, production control systems), and those that are capable of coping with change. Bureaucratic systems are almost completely closed and unaffected by elements outside their boundaries. The second type, the organic systems, are useful where organisations must change rapidly in response to the changes in a dynamic society. The information requirements of the end-users, be they customers or managers, are not fixed, and computer systems must be designed to be flexible enough to be able to provide this information. The faster the pace of change, the higher the level of uncertainty within the organisation. There is always a risk that the organic system will not provide the right information to the right person at the right time. Such systems are more difficult to create and to monitor than bureaucratic systems but might have more impact. Hence, more institutional trust (or trust in systems and organisations) is required. An example is decision support systems that are meant to allow change to be managed more effectively, as the new circumstances can be evaluated quickly, actions can be suggested, and their effects can be predicted using the model. However, the accuracy of the model is difficult to evaluate and the predictions may be inaccurate. The impact of the decision can be far reaching. Thus, there is an important and quite complex link with respect to modernity between the issues of risk and trust and information systems.

There are other reasons why trust is difficult to establish in modern society. One is because we are less likely to have personal relationships with many of the people we are required to trust. Another is our mobility and the temporary nature of our intimate relationships. We need to interact with so many complex environments (not necessarily information systems) that even the most highly educated person is unlikely to have sufficient knowledge to be able to make informed decisions on every issue, and hence, has to be guided by other experts. Since there is frequently disagreement between experts, we are also required to decide which expert to follow - but the overload of information and the conflicting opinions make this very difficult. More information does not mean more useful information. On the other hand the typical person is partially informed about many topics and is able to question the opinion of the experts. We are often, therefore, in the uncomfortable position of knowing enough to know we want to participate

in making important decisions but we need assistance in making them and have to decide who to trust. Hence, the link between information and trust becomes complex even when technology is not directly involved.

Those who are supposed to look after the good of the general population (such as health authorities) are also faced with quandaries. They must decide how much information they should make available to the public. If they tell too much, panic might result which might severely harm the economy. If the feared event does not in fact occur, (even if it does not occur because, by fully informing the public, it is prevented) the authority will probably be accused of being unnecessarily alarmist. If they underplay the risk and limit the amount of information provided to the public, they might make it more difficult to take preventative steps and if the feared event does occur, the population will say that they were not properly warned. This means that gaining and maintaining trust is difficult.

This discussion has focussed on trust in systems and institutions. Aspects of interpersonal trust will be discussed in Chapter 6 in the context of teams.

#### 4.3.5.2 Risk

Risk is "... *a marker of the attempt to break away from the past and confront an open future*." It is also an "... *active assessment of future hazards .... the more a society seeks to live in the future and shape it actively*." [Giddens & Pierson, 1998: 101]

Society has accepted that high risk can offer the chance of better returns and that being too cautious will mean that opportunities will be lost. Dreyfus [1999] explains Kierkegaard's second level or sphere of existence, the ethical level, as one where the degree of commitment means taking risks and progressing from a totally anonymous, uninvolved spectator (at the first, aesthetic level) to one where outcomes matter. Hence, the concept of positive risk has become important in our society. "*... [A]ctive acceptance of risk, and risk management, are at the core of the modern market economy.*" [Giddens & Pierson, 1998: 102] Indeed more risky, organic information systems are seen as a positive advance over bureaucratic systems.

Information plays an essential role in reducing risk. In fact, one definition of the amount of information in a message is to what extent it increases the chance of correctly predicting what will happen. It is also true that the more information a person has, the more they believe that they can control events and the less fatalistic they are the more they are inclined to exercise personal choice. Complications can also occur. For example, if we know that everyone has the same information and that information determines the market, we get back to guessing how the competition will use the information.

Giddens [Giddens & Pierson, 1998] identifies two classes of risk. External risk is calculable and based on previous experience. An example is the risk of any natural disaster. This type of risk has always existed. Manufactured risk, on the other hand, results from human intervention in nature. The likelihood, and also the extent of this risk, is more difficult to judge than that of external risk. Manufactured risk has arisen only since mankind has started manipulating nature. Fluctuation in the economies of nations, caused by the ease and speed with which information and communication technologies allow users to interact with financial markets, has become one of the most worrying instabilities in modern times.

## 4.4 Habermas' Critique of modernity

Habermas has paid critical attention to modern society and in doing so has identified the role of science, technology and industry in the formation of a new ideology that assumes many social problems to be technical problems [Held, 1980: 251]. As a result, inappropriate technological solutions are sought to solve problems that may have root causes entirely unrelated to the proposed solution. This is an issue that is of fundamental importance to information systems developers and researchers. A system is inevitably going to be unsuccessful if it is intended to "cure" a problem that is incorrectly diagnosed. This "technocratic consciousness" is exacerbated by superficial knowledge and hence, misleading impressions, presented by the new breed of technology journalists. (Numerous columns and programmes now appear as regular features in the popular press and are devoted to technology and particularly the Internet). For example, these imply that the only way to keep up with competitors is to use the most recent technology almost exclusively and as visibly as possible. This is particularly evident in media comments relating to e-commerce. Habermas refers to the "colonisation of the lifeworld" to explain the skewing, imbalance or conflict caused when "the system", which handles the administrative and economic functions of society using functional rationality, starts to encroach on the lifeworld, which can only successfully function if communicative rationality prevails.

Information technology has a significant impact on previously separate disciplines (for example, education, business management, communications and media studies). This carries with it the possibility of the colonisation of the lifeworld of the non-IT discipline. It is also becoming so closely associated with other technologies, such as communications technologies, that many people now refer to Information and Communication Technology as a single discipline [Spaul, 1997: 78].

There are various effects of applying inappropriate forms of rationality to the subjective and intersubjective worlds. The value system of the lifeworld may be affected. For example, educational values could be adversely affected if the use of the Internet in education caused

educators to over-emphasise retrieval of information from numerous sources, rather than the role of synthesis, analysis and evaluation of information and the role of discussion in education. The participation of members of society in developing the culture and norms of their environment is affected in much the same way that Marx recognised that labour was alienated by capitalist production. For example, the encroachment of television in family life leads to passive, uninvolved citizens who live vicariously.

> "*The lack of public discourse and participation by all concerned often emerges in Habermas' work as a deeper problem in the modern era than ideologically distorted thinking or false consciousness*." [Braaten,1991: 37]

This can be related even more closely to the Information Systems discipline by looking at examples of automated information systems. These encourage workers to be uncritical and to take little responsibility for whether decisions made and actions taken are actually correct or just "according to rule". Habermas considers the ultimately unacceptable solution to be one where decision making is completely delegated to computers [Held, 1980: 265].

### 4.4.1 As Critical Theory

Information technology is frequently used as a means of obtaining or retaining power. Dahlbom and Mathiassen [1995: 254] have adopted Habermas' ideas in their discussion concerning issues of interest and power in relation to systems development. The group involved in the design of a system will have considerable influence over the type and extent of information which the system will ultimately make available and will probably determine who the recipients of the information will be. Hence, various competing interests will be served or be ignored. Even outside formal information systems, technology is common in affluent homes and in environments to which more privileged members of society have access but is far less accessible by others. Access to technology gives educational opportunities, marketable skills and other advantages that means that technology perpetuates the status quo. The "digital divide" is a matter of concern within societies and between more developed and less developed countries [Bleach, 1998].

Most organisations demand that the end-users play a significant role in designing systems that will bring about organisational and social change. Differences exist regarding who should be included as end-users or role players in this process. There is often a considerable difference in the type of system that will be developed if the management and shareholders are the only people whose interests are considered. If, during the design process, the customer's needs are considered to be of paramount importance, better service, and ultimately a competitive advantage, might result. Alternatively, the well-being of the workers may be considered to be of

prime importance. This is taken particularly seriously in the development of information systems in Scandinavian countries [Lyytinen 1992; Jönsson, 1991; Hirschheim & Klein, 1989]. Critical Social Theory can be very useful as a theoretical basis for action research in order to achieve emancipatory goals, as the researcher can deliberately include the views of those people in the organisation who have least authority and power.

The concept of communicative rationality contributes to the development of information systems as a critical social theory. It emphasises the active role of all participants in any exchange of information. Each person receiving new information will evaluate it with respect to the truth claims implied in it. Hence, people will intuitively judge the reliability and accuracy of information (truth claims), its completeness, comprehensibility and possible bias (validity with respect to sincerity) as well as the authority behind it (and hence, its legitimacy) [Ngwenyama & Lee, 1997]. The end-user may accept the information, may have to reconcile it with conflicting prior held information, or might need to discuss it with others in order to reach a true understanding. This counters the idea that people are passive recipients of information, or the “conduit” theory of information where the processing is done in the computer system and transferred to the end-user. The end-user plays no role in the construction of meaning but simply acquires a copy of the information which will not differ from that of any other recipient of the information. Systems design that is aligned with critical theory and the concept of communicative rationality will recognise the need to address the needs of more role players, including those who are not in positions of authority. It also recognises that it is advisable to build in features that allow end-users to interact with, or have some discourse with the system, in order to query verify and amend information.

One way in which systems can play an emancipatory role is described by Jones [1997: 105]. Here the introduction of technology acts positively by allowing previously hidden work practices, to be revealed, instead of negatively as a threat of loss of power as is often the case. This is the case where previously unacknowledged policies have to be formally documented and specified in order to incorporate them into computerised systems.

### 4.4.2 Habermas, communications media and the WWW

Comparisons can be made between the print media (and subsequently television) and computer-mediated communication (CMC), in particularly the Internet. The print media was largely diverted from its independent role as a public forum to become the tool of powerful interests in both political and business arenas [Introna & Nissenbaum, 2000; Held,1980: 261]. Daniel Hallin uses Habermas’ concepts of rational communication in an analysis of the cultural and political roles of the mass media in the United States [Braaten, 1991: 144]. His premise is that public debate has all but faded out in the 20$^{th}$ century.

Held [1980: 260] says,

> "*From his earliest writings Habermas has been concerned with the development and disintegration of the 'public sphere' and with the principle of 'discursive will-formation' (constraint free discussion) on which it was founded. By public sphere Habermas refers to 'a realm of social life in which something approaching public opinion can be formed'. It is a sphere in which citizens can 'confer in an unrestricted fashion - that is, with the guarantee of freedom of assembly' ...*"

The Internet is similarly being colonised. Initially, the totally independent World Wide Web (WWW) was the predominant user of the Internet. The availability of uncensored newsgroups and on-line chat makes the WWW a unique example of the "public sphere" [Spaul, 1997: 78] coming close to the ideal speech condition that Habermas considers to be important for the development of societal rationality. Whereas this function remains, the Internet has now also become the backbone for e-commerce with security issues being a big consideration. Search engines can introduce a bias favouring commercial interests [Introna & Nissenbaum, 2000]. It will be interesting to see whether the system and lifeworlds will be able to co-exist on the Internet in the long run without one-sided rationality coming into play.

Concerns regarding e-mail and privacy [Weisband and Reinig, 1995] and the use of e-mail as a form of surveillance address conflicts between traditional authority and the individual worker and between the system and lifeworld.

## 4.5 Modern Information Systems

The evolution of information systems has been from those that automate systems to those that informate. Zuboff originated the term informate to differentiate between two types of computerised systems [Zuboff, 1984]. Automated systems simply replicate a manual system and possibly do work more accurately and efficiently but provide no additional information beyond that which was available before. In fact they may give less information, as was the complaint of the operators of the pulp mill who said that they needed to smell and touch the pulp in order to determine its quality [Zuboff, 1984: 66]. The second type of system is the one which provides information that would otherwise not have existed. This comes from the computer's ability to compare sets of data and identify significant differences, detect trends and patterns and process very large quantities of data. Automated systems can result in the loss of expertise as the operators are no longer required to understand why certain things happen or why certain decisions are appropriate. They are no longer required to exercise any judgement. Informating systems on the other hand can increase expertise by making more useful information available

to decision makers and hence make them aware of significant factors that might previously have gone unnoticed. It also encourages them to think of previously unidentified relationships, which they can investigate with the further help of the system. Hence, it gives the manager the ability to explore possibilities. The differentiation between bureaucratic information systems and organic systems used by Dahlbom and Mathiassen does not conflict with the idea of automating and informating although there is not a simple correspondence between the two classifications.

Various new types of information system have been developed with the aim of informating rather than simply automating. Management Information Systems were developed in order to use output from Transaction Processing Systems (Information[1]) in order to produce richer information, closer to that described as Information[2]. Expert systems of the kind that are made up of a knowledge-base, inference engine and a system assisting in the creation of these knowledge bases (knowledge acquisition facility) were developed to permit complex expertise to be "captured" and emulated and taught. Intelligent tutoring systems were proposed which could understand the topic being taught, use the teaching strategy that best suited the student and topic and recognise what the student already knew, what misconceptions he had, and hence, what should be taught and how it should be taught. Artificial Intelligence systems include Expert Systems, Intelligent Tutoring Systems, robotics, vision systems, language recognition, natural language processing, neural networks and even learning systems which could improve their own performance over time and hence, learn. These systems have both been influenced by, and have accelerated the increase of work that is knowledge based, processing information instead of physical product [Skyrme, 1997].

A different approach exists with the same goal of providing rich information rather than just automating systems. Here managers and other end-users are provided with powerful tools and fourth generation programming languages which are easy to use and which allow the user to interact with a database or spreadsheet by formulating questions and doing "what if" analyses. Decision Support Systems, Strategic Planning tools, Executive Support Systems (which allow the input of data from sources external to the organisation), and Knowledge Management Systems follow this philosophy.[*] The intention is that instead of the systems analyst deciding which information will be meaningful for the end-user (or even requiring that user to predict what information will be useful in future) that decision is delayed until there is actually a need for information. Provided that the means exist for retrieving the information easily, accurately and timeously, the chance of this information being appropriated and being used in making good

[*]Evidence of this change in general thinking is obtained by comparing surveys where the value of groupware was identified in 1996 as being "lowering travel costs" and in 1998 as sharing of knowledge [Coleman & Schiller, 1999]. The focus on less direct effects indicates a shift in attitude or a growing awareness of the importance of sharing Information[3] and not just Information[1]

decisions is definitely increased. These systems aim to produce information that is at least rich enough to qualify as Information[1] and not just as mere processed data. They attempt to address the needs of complex and uncertain environments. Thus, these systems are more like the organic systems of Dahlbom and Mathiassen and use an evolutionary approach to systems development and support the organisation structures which have arisen. Flexible, networked organisational structures can be innovative and can react quickly to new challenges and market conditions but need the support of similarly responsive information systems.

The different types of advanced information systems have had varying degrees of success and different people assess their potential differently. Where one person or school of thought assesses it as being "pie-in-the-sky" another will judge a particular idea to be enormously exciting with tremendous potential and to be definitely feasible. There is a clear trend towards developing systems that either produce rich information or provide tools that enable individuals to access information which will be meaningful to them. In many cases this information is in large chunks such as text documents instead of isolated numeric fields, or even limited database text. It might be in the form of a document or be of another data type such as sound, video or graphics. This trend is due to the fact that tasks and interrelationship between tasks is becoming more complex and hence more complex data must be communicated.

Some innovations need no selling and little justification. They are immediately adopted by vast numbers of users in a wide variety of environments and are used in ways that were originally never envisaged. Mobile phones are one obvious example and some aspects of the Internet another. These both use technology to exchange text or audio information (a characteristic of Information[2]) over a distance. In cases where it seems that the technology is being used enthusiastically, but possibly sometimes inappropriately, it is particularly important to do in-depth research to find out what the end-user is trying to do, how satisfied he is with his attempts, what changes can be made to the technology and how the process of using it can be adapted to improve results. It is necessary to see whether the advice derived from earlier research is applicable, is available and is followed.

The research undertaken here has aimed at using critical social theory and the concept of communicative rationality to determine how e-mail can be used effectively in reconstructing meaning specifically in collaborative teamwork. Lee [1994] points out that e-mail can be considered to be not only *"an instance of a telecommunication system, but also as an information system that offers decision support capabilities*."

# 4.6 Computer-Mediated Communication

## 4.6.1 The Internet (and World Wide Web)

The Internet has become a real and unstoppable force which is reshaping society in an unpremeditated way. It is used extensively in business to business applications, as part of virtual organisations, in private homes for consumer e-commerce, as a new form of socialising in e-communities, as a source of information, as a form of entertainment and increasingly as a means of achieving the goals of lifelong education. It is seen as one of the very few human inspired agencies other than war and the writing of constitutions that has had a rapid (traumatic or non-evolutionary) effect on the very fabric of society [Turoff, 1997]. Unlike war and constitutions, the Internet is affecting virtually every country simultaneously. We used to define the generations of computer hardware as being determined by the introduction of new technology (vacuum tubes, transistors, integrated circuits, large-scale integrated circuits) with the definition of the fifth generation not universally agreed upon. I propose that the de facto fifth generation is networked computers with the Internet being the global network of networks and hence, the universal hardware.

> *"Various sources have described the Internet alternatively as a vast mail system, a library system, a publication system, an economic system, and a social system. It is not any one of these things, but a new combination of them very different from a sum of their representations." [Turoff, 1997]*

The various uses of the Internet in the economy (all aspects of e-commerce including electronic data interchange, on-line auctions, on-line ordering and payment ) and in organisations where "virtual teams" act within "virtual organisations", are having a dramatic effect on the balance of economic power worldwide. Serious reversals in the so-called, "dot com" sector of the economy have significantly and negatively influenced the global economy. What is more, if the developing economies win too small a share of e-commerce compared with that of the highly industrialised economies, the present economic imbalance will be exacerbated.

The goal of lifelong education in conjunction with the goal of affordable, accessible, equal opportunity education is increasingly being recognised as relevant, and probably essential, to all societies. The large number of people who are semi-literate and others whose training is inappropriate for the modern working environment has resulted in a situation where even highly industrialised countries such as Germany simultaneously have unemployment (unemployable

citizens) and a severe shortage of manpower in areas that are vital to the well being of the economy [Graff, 2000; Handy, 1995]. Traditional classroom-based education is considered to be ineffective in many cases and too expensive in others. The fact that the Internet is being assumed to be an obvious "solution" in providing distance education and that education is rapidly becoming big business are important issues here.

The suggestion that the Internet can be used to virtually replace all aspects of university education has been considered extremely worrying by many highly respected thinkers and this would be an extreme version of the system colonising the lifeworld. Dreyfus [1999] points out that the Internet allows all information to be published indiscriminately without indication of bias, relevance, significance or even accuracy and without any accountability. He equates this level of use of information with Kierkegaard's aesthetic level characterised by curiosity but no commitment. Further aspects of telematic education are discussed in Chapter 5.

Seely Brown and Duguid [1996] emphasise the role of the university in introducing students to communities of practice rather than abstract theory. These two authors believe that the Internet can play a role in this process but also warn that, "*the Net can provide a powerful impression of interactivity and exchange while in practice denying both*."

Thus, studies concerning the way in which the Internet is used cover a field that is very wide in its scope, is extremely important and is complex, as it is not only a matter of technology but also affects social systems. The particular problem being addressed in this thesis concerns the use of the Internet as a communication channel. This is relevant to virtual organisations and telematic, or web-based, education as the same basic issues apply in all cases where groups of people use digital, telecommunication systems in co-operative work. In both, information exchange is an essential part of the activity. And in both there is a, possibly less obvious, need to communicate meaning not just text. Equally important, however, is the need to form interpersonal relationships which are essential catalysts and contexts without which this richer communication cannot take place.

## 4.7 Conclusion

In this chapter, the relationship of technology and the lifeworld in the late 20th Century and first years of the 21st Century was examined. The argument is centred on the increasing extent to which we are becoming dislocated in terms of time and space - in the sense that people who are not situated together spatially and are not reacting to each other in real time or individually have a significant influence on each other. Technology plays an essential role in this distanciation and the newest forms of technology are exacerbating it.

Hence technology, particularly information technology and information systems, form an essential part of late modern society. The development of information technology has been influenced by the change in the way we understand time and space, as well as by other characteristics of the modern era, but the technology has also played a large part in altering our perception of time and space. Information is essential to society but an increasing reliance on information and the association of information with power can also encourage extreme forms of modernity resulting in the colonisation of the lifeworld. Both trust and risk, which are fundamental in our lifeworlds, are affected by the information available. It is, however, too simple to say that more information increases trust and decreases risk. This argument will be continued in the next chapter where the specific effect of telecommunications on communication and hence, on distance education and telematic education will be examined.

Advanced information systems strive to:

- produce relevant and rich information,
- to assist people in exchanging information effectively,
- to provide people with enabling tools,
- and allows a process of searching in real time for relevant information.

The information must meet their individual needs at the time it is required. Information systems and tools which are used to communicate unstructured, textual information (Information$^2$) are popular but may not always be used effectively or appropriately. In the next chapter I will examine this question in detail.