Chapter 2

Information Systems Research

*"**Furthermore, the objectivist would say that an interpretation is correct or true if, and only if, the meaning that the interpreter attribute to the text is indeed the same, or corresponds to the meaning that the author of the text intended in the creation of the text.**

The relativist would contend that the meaning of a text evolves or changes as the historical, social, political, or moral context in which it is interpreted adapts and changes. Thus, in different historical contexts, different interpretations can be made.

Is this true also of the understanding of any text? Is the meaning of all texts realised only when they are understood? In other words, does understanding belong to the meaning of a text just as being heard belongs to the meaning of music?

Understanding must be conceived as part of the process of coming into being of meaning, in which the significance of all statements - those of art and those of everything else that has been transmitted - is formed and made complete."*
[Gadamer, 1975: 146]

2.1   Introduction

This chapter is the first of three which are described as discussing theories and philosophies in the road map of the thesis (Figure 1.1 in Chapter 1). Various different basic ontological assumptions (in Section 2.2) and views as to the nature of society (in Section 2.2.5) are examined. In Section 2.3 we see how these lead to different epistemological views and from there to different research methodologies (Section 2.4) or approaches to research and research methods (Section 2.5). Later on in the chapter these are related to Information Systems research. This is done for two main reasons, to develop a research philosophy appropriate to this project and also to as a theoretical basis for the interpretation of the research which is eventually described in Chapter 9.

As already explained in Chapter 1, this discussion is quite lengthy, starts from fundamental questions and could be criticised as unnecessarily covering ground that has been covered extensively by other authors and is, therefore, inappropriate in a doctoral thesis. It is for this reason that an overview (or summary) of the chapter is provided as an Introduction. The reader might choose to skip over sections if they are not of interest.

There are various reasons why this amount of detail has been included in building the research philosophy.

- The research done for this thesis has various aspects and interacts with several different fields of interest. Research methods needed to be identified that would be appropriate for all the facets. Thus, it was necessary to investigate a number of different approaches to research and, once an appropriate approach was selected, different research methodologies which were consistent with the overall approach could be explored. A pluralist research approach was eventually considered to be appropriate.
- The relationship between ontology, epistemology, research paradigms and research methodologies can be confusing. It was helpful to develop some form of overall structure and framework before the research was planned and actual research strategies were selected.
- Authorities specifically call for, evidence of consideration of alternative research methods in PhD dissertations [Walsham, 1995] as well as evidence that the philosophy underpinning the method has been questioned [Galliers, 1997: 142]
- "... *researchers need to reflect on their own philosophical stance, which should be stated explicitly when writing up their work*." [Walsham, 1995].

As mentioned above a second purpose is to provide a theoretical basis for analysing the discourse in virtual teams to see whether, and how, they reconstruct meaning. In order to do so the usual objective and subjective ontological approaches are discussed and a third, intersubjective view, which underlies the concept of socially constructed reality, is also introduced. This is used as a new dimension when a set of research frameworks are developed in Section 2.6. These three ways of viewing the world are subsequently used in order to highlight the essential purpose of reconstructing meaning - that of developing a shared meaning in a socially constructed world.

Habermas' Theory of Communicative Action is used extensively as the theoretical basis for this thesis and is referred to throughout. In this chapter the theory is introduced as a critical theory (in subsections 2.3.3.2 and 2.3.3.3) and is related to the research frameworks which are developed. Discussions found in the work of Habermas were relevant to many of the questions that arose as the research framework was developed. Giddens' analysis of modernity was found to be very useful as the links between modernity, information technology and the individual are explored in subsequent chapters, particularly in Chapter 4. This work is introduced only briefly in Section 2.8 of this chapter.

In Section 2.6, the academic discipline, Information Systems, is examined to see what academics and researchers believe are the characteristics and true nature of the subject and how the subject matter lends itself to different epistemological views and research methods. Some of the work of authorities (leading researchers) in the field of Information Systems is referred to in order to present current thinking on Information Systems research. In particular, examples of research in this field which refer to the critical social theory of Habermas are discussed in order to justify the choice of the concept of communicative rationality as a basis for this study. The work of Giddens, particularly Structuration Theory, has been used as the basis of a number of highly regarded research projects in this field and these are also mentioned [Majchrzak, 2000; Barrett, Sahay & Walsham, 1996; Orlikowski, 1996; 1992a; DeVilliers, 1995; DeSanctis & Poole, 1994; Orlikowski & Robey, 1991; Walsham & Han, 1991]. The concept of communicative rationality is discussed again in the context of Information Systems research in Section 2.7.

Finally, in Section 2.9, a pluralistic research approach is selected for this research and an attempt is made to justify the choice of epistemology and this research approach. A variety of strategies can be gainfully applied in Information Systems research and inevitably other approaches that have not been used in this research would provide other points of view, which would also be useful.

2.2 Ontology

2.2.1 Introduction

Before one can start to do any meaningful research on any topic, it is necessary to examine our most fundamental assumptions regarding the nature of the world in which we live and how we perceive it. Different points of view concerning reality have been the substance of philosophical debate as far back as records exist. As seems to be the case with most knowledge, there have occasionally been extremely influential thinkers who have set the debate in new directions and there have been periods during which the thinking has continued in the same general direction while being extended and consolidated. Sometimes it seems as if outside influences, such as wars or developments in technology, have been the stimulus to a new philosophical point of view. At other times, the reverse seems to be true, a new ideology has resulted in changes in government policies, attitudes towards science and so on [Banville & Landry, 1989].

Ontology is defined in the Collins English dictionary [1995] as "*the branch of metaphysics that deals with the nature of being; the set of entities presupposed by a theory*". Burrell and Morgan [1979: 1] explain assumptions of an ontological nature as those "*which concern the very essence of the phenomenon under investigation*". These latter two authors then give as an example the question as to whether reality exists as an objective, external, reality or is in fact the product of individual consciousness and hence is subjective.

2.2.2 The subjective/objective dimension

One of the different ontological approaches can be summarised as a view of the world as **objective** or **subjective**. If an objective view is taken of reality, the assumption is that measurements, taken using instruments that are independent of the observer, can be used to fully describe all aspects of reality. A subjective view of reality proposes that each individual has a unique view of the world that can only partially be communicated (if at all).

2.2.3 Realism or Nominalism

Dahlbom and Mathiassen [1995: 9] indicate that it was during the sixteenth century that the era of "modernisation" saw society transformed regarding traditional beliefs and life styles. Agrarian society was very stable and unchanging with unquestioning belief in religion and authority.

Industrial expansion, including the invention of the machine and the discovery of new continents, seemed to provide the stimulus for new concepts of democracy, revolution and religious upheaval. The more or less simultaneous advances in physics showed that the way in which we perceive the world is not necessarily the way it is. The modern idea of a separation between the subjective view of the world and its objective reality arose from these discoveries and resulted in a movement to discover objective "truth" and describe it in unambiguous terms, using mathematics and formal representations. Galileo (1564-1642), Descartes (1596-1650) and Leibniz (1646-1716) were all in the forefront in formulating this theory that supports a view of the world as a mechanism and forms the basis of modern natural sciences. They believed that "*This conception of the language of mathematics, ..., is that of an ideal language that can be read without interpretation.*" [Dahlbom & Mathiassen, 1995: 29]. This world view is realistic and postulates that the external world exists independently of the individual. This was extended to include the view that the social world has an existence that is as concrete and substantial as the natural world. Hence that the social world can also be described using measurable properties that are independent of the observer and the measuring instruments used.

The romantic world view, beginning towards the end of the eighteenth century, contrasts with the mechanistic view and stresses the subjective where previously the objective had been considered to be of paramount importance. It recognises that stable laws do not control all aspects of the world and that change, and even chaos, are a major factor. This view of the world considers people and how they interpret reality as being more interesting than objective reality. The individual, including artistic expression, unconscious desire and uncontrolled emotional expression, is central to the theories of Freud (1856-1939). Society was the primary focus for Marx (1818-1883). The romantics recognise that each individual has a unique view of the world and that this is in part formed by the context and culture of the society in which that individual finds him or herself. The ontological root of this view is that the external world is not real and is made up of artificially created concepts to which we assign labels and names, purely in order to try to impose our own meaning on them. This is known as **nominalism** [Burrell & Morgan, 1979: 4]. This view can in fact even be taken to its logic conclusion of solipsism in which it is asserted that the only thing we can be certain of is our own being and everything that we think of as external to us is in fact impossible to prove and could simply be a construction of the subconscious.

2.2.4   Socially constructed reality

A third world view, in which the two opposing views, subjective and objective, are partially reconciled, takes the position of the individual as an intelligent actor within society or within a network of other actors, social structures and even artifacts. In this view, the individual both changes and is changed by the larger social structures. The interaction between individuals,

leading to mutual understanding, and between individuals and social structures, is considered to be the basis on which society is formed. For example:

- Hegel argues that we are shaped by society as well as shapers of society [Braaten, 1991: 3].
- Latour's Actor Network Theory refers to "actants" which may be people or artifacts and are linked in flexible, heterogeneous, networks [Latour, 1996].
- Giddens proposed Structuration Theory, in which the human agent may shape the social structure as well as shaped by it (the duality of structure) [Giddens, 1984].
- Gadamer's philosophical hermeneutics highlights the importance of recognising one's own prejudices and the need to interpret text in the larger context and the context in terms of the new text (the hermeneutic circle) [Introna, 1992]
- Habermas' Theory of Communicative Action [Habermas, 1984] is founded on the premise that society consists of participants attempting to reach rational consensus. Social reality is constructed through consensus building and is inherently oriented towards mutual understanding. "*...[R]eason is inherently based upon mutual commitments to standards of interaction or communication.*" [Braaten: 5]

2.2.5 The order/conflict dimension

Although the ontological choice between subjective and objective viewpoints is commonly accepted, Burrell and Morgan [1979:11] make use of a further dimension obtained from sociological assumptions about the nature of society, namely whether society is considered to be stable and amenable to consensus (orderly) or naturally turbulent, perpetually changing, with the primary reason for change being struggles for power (conflict). Combining this order/conflict dimension with the object/subjective ontological dimension produces a two-dimensional table (see Table 2.1), each quadrant reflecting a distinctly different group of social theories. This framework provides a useful way of analysing these theories. It is not going to be discussed in any detail here but in this analysis, Critical theory, the social theories of the Frankfurt school and Habermas in particular, are classified as Radical humanist, that is tending towards a perception of society as subjective and conflicted and not, as will be argued in Subsection 2.3.3.1, as Interpretive.

Table 2.1: Four paradigms for the analysis of social theory (adapted from Burrell and Morgan [1979])

	THE SOCIOLOGY OF RADICAL CHANGE Conflict		
S U B J E C T I V E	**Radical humanist** *Frankfurt school and Habermas* Critical theory	**Radical structuralist** *Marxist theory* Conflict theory	**O B J E C T I V E**
	Interpretive *German idealism: Kant, Husserl* Phenomenology Hermeneutics	**Functionalist** *Sociological positivism* Objectivism	
	THE SOCIOLOGY OF REGULATION Order		

2.3 Epistemology

2.3.1 Introduction

Epistemology: "*The theory of knowledge, esp. the critical study of its validity, methods and scope.*" [Collins English dictionary, 1995]

Epistemics: "*The interdisciplinary study of knowledge and human information-processing using the formal techniques of logic, linguistics, philosophy, and psychology.*" [Collins English dictionary, 1995]

" *... [A]ssumptions about the grounds of knowledge - about how one might begin to understand the world and communicate this as knowledge to fellow human beings. ... [F]orms of knowledge*" [Burrell & Morgan, 1979:4]

Klein, Hirschheim and Nissen [1991: 5] define epistemology as, "*[T]he nature of human knowledge and understanding that can possibly be acquired through different types of research and the appropriateness of the methods of investigation.*"

These same authors take a point of view derived from Habermas, namely that science is considered to be, "... *a convention - related to societal norms, expectations, and values - engaged in the search for understanding.*" [Klein, Hirschheim & Nissen, 1991] Knowledge claims are supported by the force of the better argument and are not final, as further information may result in them being revised.

A central question is, Is knowledge real and capable of being transmitted or personal? Can it be acquired or must it be personally experienced?

2.3.2 Positivist

The positivist approach to extending knowledge is based on the premise of a realistic ontology. The researcher is expected to add to an existing body of knowledge by acting as a remote observer and gathering generally quantitative data from which it is possible to deduce laws. Deductive research, which is a systematic method of deriving conclusions that cannot be false when the premises are true [Collins English dictionary, 1995] may be used. This method is especially amenable to formalisation and study by the science of logic. The rationalists (Leibniz, Spinoza and Descartes) chose this approach. Inductive research, is a process of reasoning that is based mainly on experimental evidence. A general conclusion, which goes beyond the information contained in the premises, is drawn from a set of premises. This type of research is also positivist and was chosen by the empiricists (Locke, Bacon and Hume). The laws, or empirical generalisations, mean that the positivist researcher is not interested in particular cases but in general truths that will allow one to explain and predict outcomes. Research can be replicated and hence can be validated or proved. This means that it is necessary to state hypotheses in unambiguous terms and it is for this reason that positivists prefer to state ideas in mathematical terms. Positivist epistemology implies that society as well as nature can be predicted and controlled. Thus the same methods and aims of inquiry can be applied to both the natural and social sciences (methodological monism instead of dualism).

Braaten [1991: 107] claims that Anglo-American philosophy by and large has its roots in positivism. In the discussion of Habermas' views on positivism, she says that there are three principal issues or "... *major points of difference remain between the direction that Habermas envisions for philosophy and social science and the visions that have been dominant on this side of the Atlantic.*"

Proponents of positive research believe that:
- It is value free (unbiased) and that no other form of research can be unbiased.
- All knowledge is scientific knowledge.
- If a concept cannot be stated unambiguously and be proved by means of the scientific method, it cannot claim to be knowledge (methodological monism).

2.3.3 Anti-positivist

Anti-positivist social philosophers embrace a hermeneutic methodology to seeking understanding and knowledge, not in order to control but to gain enlightenment. This epistemology does not try to find generalised explanations or make predictions but instead aims to allow interpretation and hence, ideally, understanding of particular situations. Dahlbom and Mathiassen [1995:225] say that "*...hermeneutics will help us understand the complex interplay of people, methods and technology, and the important role of interpretation, personal interests, and values involved in the use of these techniques.*" These two authors [1995: 215] also say, "*True knowledge is personal*". The supporters of hermeneutic and interpretive research believe that it is in fact a fallacy that the researcher can, or should be, a totally remote observer. They argue that there are some types of information that can only be obtained by means of a dialogue with the subject. In addition they argue that positivists deceive themselves (and their readers) by claiming that their data are value-free or neutral. The unavoidable bias and prejudices of the researcher inevitably have a bearing on the questions asked, the way in which they are asked, and the way in which results are analysed. In addition, subjects, when replying to even the simplest questions, tend to interpret them differently and cannot be said to reply according to a uniform set of standards.

Anti-positivists criticise the positivist point of view because it denies the possibility of change. They view it as a form of ideology that implies that society is ruled by laws and hence that social change is impossible. "*Critical social theory's critique of positivism is its central and most enduring feature.*" [Agger, 1998:5] "*CST endorses the possibility of progress.*" [Ibid.: 4]

Galliers and Land [1987] maintain that it is difficult to reproduce a real-world situation under laboratory conditions. Only a limited number of factors can be studied in a laboratory and relevant factors may be ignored as it is too difficult to assign values to them.

Various authors, for example Orlikowski and Baroudi [1991], divide research strategies that embrace an anti-positivist epistemology into Interpretive and Critical research strategies or paradigms. Jönssen [1991: 376] sees a key difference between Interpretive and Critical research resulting from the view of society as being ordered or in conflict. Interpretive research believes in underlying social order resulting from the shared norms and practices in

organisations. The interpretive researcher does not adopt a critical point of view but attempts to see issues from the participant's point of view.

2.3.3.1 Interpretive

Burrell and Morgan [1979] consider Interpretive sociology to be the research paradigm associated with a subjective ontology and a view of society as orderly. Hermeneutics, phenomenology and phenomenological sociology are given as examples of social theory within the paradigm. Associated schools of organisational analysis (that is, the study of organisations) are ethnomethodology and phenomenological symbolic interactionism. Hirschheim and Klein [1989] call this paradigm Social Relativism. They believe that in systems development "*emancipation by means of rational discourse*" falls within this paradigm and they refer to Habermas in this context, indicating disagreement as to whether Habermas' theories should be classified as viewing society as fundamentally ordered or in conflict. Certainly, the fact that Habermas emphasises consensus and mutual understanding supports the view that his work is more appropriately considered to be within this paradigm. Possibly Myers [1994] resolves this problem by differentiating between "pure hermeneutics" and "critical hermeneutics". This is discussed below. Myers [1997b: 241] characterises interpretive research as being based on the assumption that, "t*he access to reality (given or socially constructed) is only through social constructions such a [sic] language, consciousness, shared meanings and instruments.*"

2.3.3.2 Critical

Critical Theory is a philosophy of science [Jönsson, 1991] and a group of social (not sociological) theories [Agger, 1998] from which a methodology is derived (or on which the methodology depends). It is based on the philosophies of the Frankfurt School. It is anti-positivist and strives towards emancipatory objectives, is generally considered to take the side of the worker rather than the owner or manager and supports the supposition that society is perpetually in conflict. Hence, in the order/conflict continuum (or dimension) in the framework created by Burrell and Morgan [1979], it falls within the area of the Sociology of Radical Change. This group also accepts an intersubjective (or socially constructed) ontological point of view. This group of theories would, therefore, be classified as Radical Humanism [Burrell & Morgan, 1979: 32] or Neohumanism [Hirschheim & Klein 1989: 1207]. Habermas is one of the most prominent contemporary philosophers who have built on this foundation. Most applications of Critical Theory, refer to Habermas' Critical Social Theory (CST) - consisting of theories of societal rationalisation, universal pragmatics and communicative rationality.

These, and in particular knowledge interests and the concept of communicative rationality, will be discussed in detail in the section following this.

Agger [1998: 4] defines critical social theory as a theory cluster that:

- Opposes positivist research. "*Critical social theory's critique of positivism is its central and most enduring feature*" [Agger, 1998: 5]
- Sees the role of time (history, historicty) as very significant and expects rational social progress in terms of a reduction in oppression, exploitation and domination.
- Regards power and domination as institutionalised, that is, embedded in the structure of society.
- Argues against determinism. The future is not preordained in the past.
- Supports multi-disciplinary research and strives for a holistic perspective.

Critical research should foster criticism and reflection and uncover inherent conflicts and contradictions. Its goal is to initiate change. Lyytinen [1992: 171] advises that, "*more concrete and problem-focussed studies of the implications of Critical Theory for IS*" should be undertaken, "*... critical inquiry is concerned with the improvement of the human condition through IS, criticism of alienated and distorted practices, development of alternative IS forms and organisations, and with finding and enclaving an arena of emancipatory IS activity.*" Ngwenyama et al [1997: 120] say, "*... The CST approach is based on the ideals of emancipation from blind technological rationality and uses of IT that enhances freedom and justice.*"

Ngwenyama [1991: 272] says, "*Although critical social theory does not have its own research methodology, many, currently available interpretative methodologies can be adapted to its needs.*"

2.3.3.3 Habermas' Theory of Communicative Action

Habermas followed in the tradition of the Frankfurt school by developing the Theory of Communicative Action as a critical theory which not only explains the evolution of modern society but also reveals the nature and causes of its failures.

According to Habermas, the evolution of society depends entirely on its ability to extend its rationality and this is done by means of discussion between stakeholders and ultimately agreement (that is, by means of mutual understanding and a common commitment to achieving a rational consensus). The three spheres of culture, derived from Kant's faculties of reason, play a significant role in Habermas' Theory of Communicative Action. These are: The theoretical sphere of science, the practical sphere of morality and law, and the aesthetic sphere of personal perceptions. Habermas contends that each of these, which he relates to the objective,
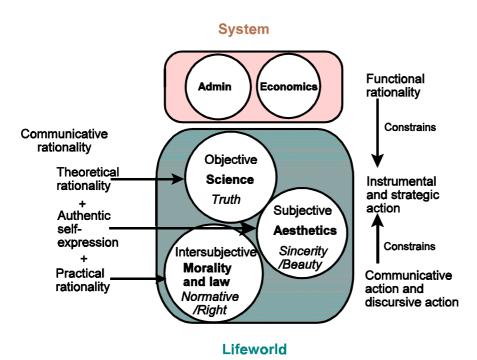
Figure 2.1: Relationship between forms of rationality and the 'worlds' to which they apply

intersubjective or social, and subjective worlds [Braaten, 1991: 61], requires a different form of rationality to be exercised, which together constitute communicative rationality. "*Habermas's conception of communicative rationality encompasses theoretical rationality, practical rationality and the rationality of "authentic" self-expression*." [Braaten, 1991: 72] Figure 2.1 shows how the three spheres are related to the objective, subjective and intersubjective worlds and the various forms of rationality which are applicable. These spheres are applicable to the lifeworld which is both universal and personal. Natural language and behaviour are two forms of action that are used to achieve the goals of the lifeworld.

There are four main types of social action, namely communicative, discursive, instrumental and strategic and they "... *represent different aspects of intentional human behaviour in social setting.*" [Ngwenyama & Lee, 1997]. Two of these types of intentional behaviour (or social action), namely communicative and discursive action, are considered to be positive. Communicative action is intended to convey information and hence needs to be clear, complete, and in context, as well as sincere, as the speaker should believe that what he says is true. Discursive action is a more specific form of communicative action, which occurs when two actors do not agree and they justify their opinions by means of convincing arguments. It has the same characteristics of comprehensibility, completeness, context and truth. Thus these two forms of behaviour are manifestations of communicative rationality. The remaining two types of social action, instrumental and strategic action are considered to be negative behaviour and are, therefore, a more limited form of rationality. These types are discussed in more detail later.

As mentioned above, the lifeworld can be considered to consist of three spheres, each associated with a different form of rationality which together constitute communicative rationality. Theoretical rationality is applicable to the objective world of scientific and philosophical knowledge. In this world something is considered to be true if an assertion is made (a truth claim) and is universally accepted. If objections are made to the claim, a process of debate or discourse will be undertaken. The outcome is influenced solely by the force of the better argument. This assumes that ideal speech conditions prevail, that is, that anyone can make a truth claim, anyone else can counter the claim and hence all relevant information will be available. As all participants are committed to achieving consensus on the basis of the most rational argument, there will be no misrepresentation. This theory accepts that truth claims are never absolute as they may be challenged at a later stage and be overturned.

Practical rationality is concerned with determining ethical social norms and also requires universal consensus under ideal speech conditions. Normative validity claims examine generalisable, legal (or justified) needs and interests where, not only does each individual believe that the norm is applicable under all circumstances and should be applied consistently, but that the same norms apply in all societies. These norms govern the intersubjective world.

More frequently, needs and interests are non-generalisable. These personal desires and values, or values belonging to a community, may be considered to refer to the 'good' life rather than the 'just' life. This form of rationality refers to the subjective, aesthetic world and it is not necessary for there to be universal consensus. Aesthetic validity claims are judged according to whether they are sincere (truthfulness).

This multifaceted definition of rationality (concept of rationality) contrasts with concepts in which rationality was simply defined as the choice of means to achieve given, usually material, ends. The more limited view of rationality is called instrumental rationality and tends to result in people being seen as objects that can be used simply in order to achieve the required ends (reification). This inevitably leads to manipulation, domination and oppression of some people by others. Strategic action is similar to instrumental action in that it is manipulative and means-ends oriented. Instrumental action and strategic action are frequently encountered within the lifeworld but since they deny ideal speech conditions they are separate from (they are in opposition to) the concept of communicative rationality.

Habermas recognises circumstances in which another positive form of rationality applies. Functional rationality, which is routine, may be automated and is linked to economic and administrative systems (known collectively as 'the system'). The decisions taken here are neither universal nor personal as they are independent of the agents' intentions. Money and power are the media which are used to achieve the goals of the system. The two forms of positive

rationality, communicative rationality and functional rationality, together constrain instrumental and strategic action.

Habermas uses his concept of societal rationality (which arises from this understanding of the types of rationality and how they are developed) to give two philosophical perspectives. The one is a description of the evolution of rationality and the second is a critique (normative). The critique of modernity gives reasons for many of the negative trends evident in modern society. These are seen as a loss of meaning and antisocial behaviour resulting from one-sided rationalisation. One-sided rationalisation (or the colonisation of the lifeworld) results from inappropriate forms of rationality being applied, in particular where functional rationality (appropriate in 'the system') is applied to the lifeworld.

2.4 Methodologies

2.4.1 Quantitative research

One form of quantitative research is carried out in the positivist tradition. Here an attempt is made to isolate variables and to measure a small number of dependent variables against an independent variable. This requires designing an experiment in which variables that are not being measured are kept constant and hence, in the social sciences, requires a control group to be matched with the group in which the new factors will be present. The data gathered is usually numerical and statistical analyses are used to determine whether the effect of the experimental factors is significant. Quantitative data can, however, also be obtained from surveys and be more descriptive in nature. Such data may be used to support qualitative research or provide a descriptive context for it.

2.4.2 Qualitative research

Qualitative research is carried out when the anti-positivist (interpretive and critical) research paradigms are adopted. Myers [1997a: 240] says that, "*[a] common misconception has been to equate qualitative with interpretive research*". He does not, unfortunately, expand on this. Both text and numeric data are used. Laudon [1989] says that the distinguishing difference between quantitative and qualitative research is the number of organisational units involved, the kinds of questions asked, the manner of reasoning about evidence and the length of time over which the phenomenon is studied.

Busby and Payne [1998] give the following characteristics of qualitative research:

- holistic
- phenomena arise through a multiplicity of origins
- situated
- grounded, typically starting with data and developing theory by induction
- recognises diversity
- based on field work
- requires adaptability and high levels of cognitive effort, understanding, and self-confidence on the part of the researcher
- complex and time consuming
- depends on good planning

2.4.3 Hermeneutics

Hermeneutics can be considered to be either a social theory (embodying the philosophy of Husserl) or a methodology. Klein and Myers refer to it as, " ... *A "bridgehead" for making a contribution to interpretive research methodology.*" [Klein & Myers, 1999] As a methodology it is used to analyse the textual data obtained during qualitative research. It is primarily concerned with the meaning of text or a text-analogue such as an organisation. The meaning is obtained by a process of interpretation in which both the broader picture, as provided by the text as a whole, and the individual parts are constantly interacting and contribute to create a more accurate and complete understanding of the text. This interaction and mutual revision of meaning between the whole and the detail is known as the hermeneutic circle.

Klein, Hirschheim and Nissen [1991: 9] see hermeneutics and critical theory as closely related and that action research (and semiotics) can be used in the process. Burrell and Morgan [1979], on the other hand, have classified hermeneutics as an example of Interpretive Sociology with a view of social order rather than conflict.

Myers [1994:185] says that critical hermeneutics (or contemporary hermeneutics) was outlined by Gadamer and Ricoeur. Alternatively, Habermas developed Critical Theory, Gadamer developed hermeneutics, and Ricoeur linked the two theories [Myers, 1997b]. It is, therefore, an integrative theoretical framework, combining interpretive and critical elements and is in effect a meta-theory. Whereas the original hermeneutics stressed an uncritical understanding, an attempt simply to see the issue from the point of view of the person who wrote the text, critical hermeneutics interprets the content in terms of the present and in relation to the interpreter's own point of view, as well as the time and prejudices of the original author. Hence it takes a broader context into account that would include historical change. For example, knowledge of

external conditions, conflicts and contradictions within the society at the time in which the text was written, which the author might not have been fully aware of and that could have resulted in unintended consequences would affect our understanding of what was written. But also, recognition of idiosyncrasies in the present social system (that affect the way we interpret text) and how these differ from the past, or how they evolved from earlier systems, will add to the meaning acquired from the text itself. Gadamer emphasises that the researcher must be consciously aware of his or her own prejudices and predisposition to prejudge and the role that these play in interpreting text.

Table 2.2: Summary of three theoretical approaches [Myers, 1997b]

Theory	Primary focus	Descriptions
"Pure" hermeneutics	Meaning	Interpretive
	Intentions	"Subjective"
Critical theory	Contradictions	Critical
	Oppositions	"Objective"
		Historical
Critical hermeneutics	Totality of Meanings	Interpretive and Critical
	Social Reality	Subjective and Objective
	Intended and Unintended Results	Historical

Myers draws the distinction between research informed by Critical (social) theory, which always focusses on the class conflict and strives to empower the worker and critical hermeneutics, which he claims does not have a preset agenda. Myers [1997b] says that in critical hermeneutics no final interpretation is ever achieved, as every interpretation must be critically reflected upon. Table 2.2 provides a summary of essential differences between "pure hermeneutics", critical theory and critical hermeneutics.

2.4.4   Ethnography

Prasad [1997] defines ethnography as a methodology (and hence associated with a specific ontological and epistemological view) rather than a method that simply implies a set of techniques and methods. It is related to interpretive, qualitative fieldwork. Ethnographic research, in general, sets out to investigate how, for example, systems in organisations, " *... affect social interaction and the creation of shared meanings.*" [Myers, 1997b]

Ethnographies are similar to interpretive in-depth case studies but the researcher spends more time in the field and is more intimately involved in the social group that is being studied. There are three basic differences between case studies and ethnographic research. The ethnographic research does not have formulated research questions and hence avoids preconceived ideas, it avoids all semblance of logical positivism and does not have hypotheses or rival hypotheses but tries to develop a "thick description" of what actually occurs and, finally, it does not proceed according to a time schedule [Yin, 1989]. In ethnographic research not only are interviews and documentary evidence collected as data, but data is also collected during participant observation. This type of research occurs over a significant period of time (for example, eight months in the case of Orlikowski [1991]). Myers indicates that it is in this way that the ethnographer searches out and analyses symbolic forms. Prasad refers to the use of "thick description" in which the full context is included to ensure that deeper meanings are uncovered.

Prasad [1997] emphasises that it is essential in ethnography that the social situation be understood from the point of view of the participants (subjects). Myers [1997b], on the other hand says that the ethnographer does **not** need to empathise with the subjects.

As he did with critical hermeneutics, Myers [1997b] has defined critical ethnography as a particular form of ethnography that is informed by critical hermeneutics. Critical ethnography differs from classical ethnography in various ways, most importantly in that it recognises that social systems change over time and that the historical context is important and that a critical viewpoint is adopted.

2.4.5　　Phenomenology

Phenomenology embraces the concept of purely objective truth but it is nevertheless not a positivist research paradigm and the analysis of research results is not statistical or even interpretive. It is instead purely conceptual or cognitive. The researcher consciously tries to strip away preconceptions and prejudices in order to arrive at an objective view of the phenomenon and hence its true essence. This is done in an iterative or stepwise fashion by means of reductions where assumptions are identified and set aside or "bracketed". In this way, the "true nature" or "true meaning" of something can be reached. In contrast to a positivist view point where the epistemology seeks to find out "how things work" by conducting controlled experiments to detect underlying rules, phenomenology seeks to find out "what things are" and describe them accurately. Hence the research methods used for data collection are more likely to be ethnographic or case studies. In phenomenology, as for all anti-positivist research paradigms, it is not possible to prove that the findings obtained are true. Instead the researcher has to rely on other people accepting the reliability of the method and on an instinctive recognition of the truth of the description.

Boland [1985] explains Gadamer's view of phenomenology as being an intersubjective one in which researchers attempt to recognise their own prejudices while discussing or debating issues. Thus, understanding of issues requires interpretation and active attempts to reach a more objective point of view.

According to Boland [1985] the phenomenological approach does not seek only to describe a phenomenon objectively, but also to view it critically and seek to change it. Hence, according to this point of view, phenomenology is closely associated with Critical Theory and critical hermeneutics.

2.4.6   Pluralist research strategies

Klein, Hirschheim and Nissen [1991], together with many other authors [Myers 1997a; Mingers & Brocklesby, 1996; Jackson, 1992; Landry & Banville, 1992; Orlikowski & Baroudi, 1991] make a plea for methodological pluralism. They classify research approaches into five groups.

- Supremacists who believe that there is only one appropriate method for finding the one truth or reality;
- The contingency approach, which proposes that there are a range of methods each having its own strengths and weaknesses and that the appropriate choice depends on the focus of the research. The problem with this is how to decide what is a good match of problem and method, as the contingency approach implies that there is still only one truth and one appropriate method for finding it.
- Pluralism, on the other hand, suggests that there is no "correct" approach. Different approaches will identify and clarify many different points of view, all of which may simultaneously be valid and valuable and all of which are biassed. As no single method can ever capture all the richness and complexity of reality, the use of a variety of approaches will allow a more complete understanding of the phenomenon to be built up. This approach accepts that claims of truth may be revised (or are in a perpetual state of revision);
- Eclectics say that a mixture of the best from a variety of approaches will be most fruitful for a specific problem;
- Dialectics is based on the concept of two dominant approaches involved in a struggle. Eventually, from this struggle, a third approach emerges.

2.5 Research Methods

2.5.1 Case studies

A case study "*... is a way of organising social data so as to preserve its unitary character.*" [Craig Smith, 1990]. Case studies take the context of the events being researched into account and hence provide a much more complete understanding of the meaning of results and conclusions drawn from them, including their limitations, than is generally the case with positivist research. During a case study a social situation is identified that will provide an apt illustration of a general principle or which, when analysed, will reveal a general principal. An extended case study is a study of a process, over a period of time, during which information emerges.

Yin [1989] expects the researcher to structure case studies by

a) identifying specific research questions before the research begins,

b) "*emulat[ing] logical positivism in developing rival hypotheses and collecting external evidence bearing on these questions*" Yin [1989]

c) doing fieldwork in a systematic way according to a planned schedule.

Walsham [1995] considers Yin's position to be that of an "*implicitly positivist stance in describing case study research*" but agrees that this approach emphasises "how" and "why" questions that are central to interpretive research approaches.

Data is generally collected during unstructured or semi-structured interviews and from unpublished documents and newspaper and magazine reports, and these are analysed using an interpretive or phenomenological research paradigm. The researcher adopts the role of an objective observer as far as possible, although it is recognised that there will inevitably be a certain amount of subjectivity. Craig Smith [1990] sees the fact that it is impossible for a human to be entirely objective in studying aspects of the human world as the basic epistemological problem of social science. He points out, however, that the researcher must also be sufficiently in touch with the issue to be able to make sense of the research findings.

Most Management Information System issues simply cannot be studied completely using laboratory based positivist research methods as they are too complex and it is impossible to identify all the variables, let alone measure or control them. The MIS issues are nevertheless important and valid, general conclusions can be reached by studying specific contexts using the case study approach. Craig Smith [1990] argues that research methods that are "approved" (that is, quantitative research methods) should not dictate what is important research terrain. It is

wrong to determine what issues are researched according to how easily they can be studied using standard research methods.

It is possible to use positivist, interpretive or critical research methods within case studies [Klein & Myers, 1999]. An example of a positivist approach would be using questionnaires together with other purely numeric data collection methods followed by statistical analyses to determine correlations. This is not recommended as the sole means of collecting and analysing data, as the advantages of rich description are lost and the disadvantage of a small and unrepresentative sample may be present. It is, however, possible, and probably desirable, to combine interpretive and numeric methods.

The use of a case study allows the social unit to be studied and to be represented as a whole. It is important to note, however, that the researcher must simplify the description to some extent in order to highlight the elements which are considered to be important. Case study research is a method of organising data and, ultimately, of reaching conclusions from that data. Theories based on case studies are built using logical inference instead of the statistic inference techniques used in positivist research. These theories are validated by theoretical and practical discourse, that is, the truth claims made by the researcher can be challenged and debated and will be judged according to the strength of the arguments put forward by the various parties. The plausibility of the argument, rather than the fact that findings can be replicated, determines whether the research findings are accepted. Hence, despite the fact that only a few cases are studied, general conclusions can be reached by means of logical argument. The cases studied are selected not according to how typical they are perceived to be, but rather on how well they illustrate the point being made, that is, their explanatory power. It is possible, therefore, that atypical and even extreme cases may deliberately be chosen.

As with other approaches, it is essential that research is done systematically and is well planned. Interviews should be tape recorded and transcribed. The researcher needs to be aware of problems that can arise, such as biassed and invalid data. This is obtained when interviewees give insincere input (for example, when they try to provide answers that will please the interviewer, simply out of politeness). The way in which the data will be analysed (for example how it will be categorised) may be difficult to specify precisely ahead of time and it is likely that there will be a number of false starts to this process.

The choice of a research methodology that is appropriate to the matter being researched will determine whether the results are meaningful to people who did not participate in the research, that is, the external validity of the research. A case study approach is indicated where the phenomenon cannot be studied outside its natural setting and the variables cannot easily be isolated or accurately measured quantitatively.

2.5.2   Action research

Action research can be considered to be a special case of case study research. Jönsson [1991] gives a detailed explanation of what he considers action research to be. One definition might be that the researcher actively brings about change while doing the research. There are two important components in the research, namely, the processes of generating change and generating knowledge [Stowell et al, 1997: 161]. The dual importance of theory and action are central to this research method. An additional consideration is that there should be a mutually satisfactory outcome between the two interests represented by these two components, that is, between the researcher and the organisation.

The researcher, together with participants from the host organisation, proposes changes and tries them out. Hence, the researcher is a visible and active participant, not just an observer, and embraces and promotes certain values quite openly. The research does not seek to determine simple, unidirectional laws. It is carried out in unique situations and hence cannot be replicated or generalised in the way positivist research can be. Nevertheless, it should lead to the researcher gaining insights that could be applied to other situations where similar circumstances are recognised.

Action research has the following characteristics:
- It is a science of practice, that is, is applied within the real or natural context not in a laboratory. It is action oriented as its name suggests.
- It is a collaborative process in which the researcher *and* the other participants are jointly involved in seeking insights.
- It is a learning process. This follows directly from the previous point. It encourages and stimulates problem solving.
- As it is a process, it is part of an ongoing search for better ways of doing things. It does not usually produce final solutions although it may produce partial solutions, improvements or even errors that indicate the need to change direction.
- A hypothesis is not proposed before the data collection is started, as is the case with positivist research, but the researcher attempts to keep an open mind, allowing theories to emerge. It is accepted that there is a great deal of uncertainty in these theories. This is not really a problem. The theory (or story) may reveal useful aspects even if it is not completely sound.
- Contradictions and areas of conflict or differences of opinion are actively sought and hence there is a certain amount of risk in bringing previously unacknowledged grievances and power struggles into the open. This type of research is, therefore, low on control.

- Complexity and uncertainty are inevitable and acceptable.
- The data collected is largely in the form of text and largely unstructured.
- More than one opinion or point of view is sought, partly to uncover problems and partly to validate conclusions.
- Historicity is recognised. The decisions and actions taken here and now are unlikely to be the same as those chosen yesterday or tomorrow, by other actors, or in some other place.
- Because it is action and learning oriented, the research is by definition relevant.
- It may yield uninteresting or no findings. [Truex, 2001]

A number of these characteristics can be identified as being characteristics of anti-positivist research and of critical or interpretive research.

Stowell et al [1997] give a number of practical guidelines for doing action research. They believe that it is important that the client organisation understands clearly that the research being undertaken is action research, what action research is intended to achieve and that outcomes are difficult to predict as the "*catalytic potential of IS may create unimagined issues*" [Stowell et al, 1997: 163]. There is also a need for careful planning and management of the research for two reasons. Firstly, in order for the results to be accepted as sufficiently rigorous the data must be collected and recorded systematically. Secondly, the goal of achieving learning must not be overlooked at any time. The fact that the research is undertaken amidst the complexity and hubbub of a real workplace environment can make it difficult to ensure that both of these requirements are met and hence the planning must specifically be geared towards making practical arrangements that will allow for them.

2.6 Information Systems Research

2.6.1 Introduction

"*The interpretive approach can be applied to IS implementation research, the advantage being that it is able to deal with the social and political nature of information systems implementation.*" [Myers, 1994: 185]

Hirschheim and Klein [1989] adapted Burell and Morgan's schema [1979] to one specifically intended for information systems development but that is also useful in deciding on appropriate Information Systems research methodologies and methods (Refer to Table 2.3).

Table 2.3: Four paradigms for Information Systems Development (adapted from Hirschheim and Klein [1989])

Conflict		
S U B J E C T I V E	**Neohumanism (radical humanist)** Theoretical basis: Habermas' Theory of Communicative Action, Critical Social Theory Methodologies: emancipatory approaches	**Radical structuralism** Theoretical basis: Dialectic Materialism Methodologies: Trade union led approaches	**O B J E C T I V E**
	Social relativism (interpretist) - Theoretical basis: Symbolic Interactionism, sense making and emerging meaning are a function of experience and hence unique, not rationalist, and relativist Methodologies: SSM and participatory group work, and ethnographic approaches	**Functionalism** - Theoretical basis: instrumental reasoning, objective reality, naive realism, Methodologies: order- structured analysis, "hard", information engineering approaches	
Order		

This is appropriate if one accepts, as is now usual, that Information Systems is a social science. It allows the researcher to deliberate on the various possible ways of seeing the world into which Information Systems must fit and, in particular, how this researcher personally views the world so that an appropriate theoretical basis can be studied and applied consistently. These authors illustrate the applicability of the framework by describing four different information systems, each one of which was developed using a different theoretical paradigm.

2.6.2   Information Systems Research framework

The following research framework was derived in order to try to systematically review research methodologies and link them to ontologies and epistemologies with the ultimate aim of assisting in determining whether selected methodologies and methods are appropriate considering the research philosophy adopted. The framework is made up of three separate tables. The first uses the scheme for analysing assumptions about the nature of social science developed by Burrell and Morgan [1979: 3]. However, in line with criticism by Probert [1997:48] of the "binary opposition" of the simple Objective versus Subjective philosophical view proposed by the originators of this scheme, it has been extended to include a third alternative that I have labelled Intersubjective. (Walsham [1995] refers to the work of Archer (1988) who distinguishes between 'external realism', 'subjective idealism' and ' internal realism'. These correspond to a large extent with the 'objective', 'subjective' and 'intersubjective' ontologies proposed here.)

Intersubjectivity proposes not that there is no objective reality, nor that individuals do not each have unique views of reality, but that there is a third factor, the negotiated reality obtained by individuals reaching mutual understanding by discussing and ultimately agreeing what the "truth" is. The Objective view of reality is an exclusive one, proposing that everything can be measured and that reality is independent of the observer and unchanging. The Subjective view is also exclusive and contradicts the Objective view. It says that there is no external, absolute reality but only individual concepts. By contrast, the Intersubjective view reconciles both of these views and includes the additional factor, the contribution of groups, organisations, or society in constructing reality.

The extended scheme (Table 2.4) indicates the ontology, epistemology and perception of human nature associated with each of the philosophical views. The term "duality of structure", used by Giddens, is adopted as the perception of human nature related to the Intersubjective view. It refers to the fact that an individual's actions and beliefs are influenced by the structural properties of society but at the same time the social structures are themselves always subject to change as the result of the influence of individuals. An attempt is then made to link the validity claims from Habermas' Theory of Communicative Action and his Knowledge Interests into the scheme. The scheme then gives characteristics of the methodologies used in social research for each of these views.

The second research framework (Table 2.5) shows the research strategies that are aligned with two of the epistemologies identified in Table 2.4. The third epistemology, methodological pluralism, is not included as it manifests itself as a combination of the research strategies and goals of the other two. Instead interpretive and critical research strategies, which are both forms of anti-positivist research, are compared with positivist research.

The third and final framework in the set (Table 2.6) reflects yet more specific characteristics of research. This framework has been separated from the previous one as methods are considered to be largely independent of epistemology [Galliers, 1997:154; Myers, 1997a: 241]. The link between Table 2.5 and Table 2.6 is the methodology (though this may in fact be tantamount to linking back to epistemology). A new group of methodologies, not mentioned in Table 2.5, is included in Table 2.6, namely the group of non-empirical methodologies. This links up with a framework for classification of Management Information System research strategies provided by Alavi and Carlson [1992] in which they discriminate between non-empirical strategies (based on ideas) and empirical strategies (based on observation).

Table 2.6 (and to some extent Table 2.5) refers to more tangible characteristics of research methods and strategies and hence becomes more specific, and more controversial. Galliers [1997: 152-153] refers to criticism of the framework he had proposed in earlier publications.

Table 2.4: An extended scheme for analysing assumptions about the nature of social science

Ontology	Objective Realism	Subjective Nominalism	Intersubjective (Social) Socially Constructed Reality
Epistemology	positivism prediction and control	anti-positivism explanation and understanding	methodological pluralism the full spectrum
	prescriptive and normative	descriptive	the full spectrum
	basically fixed (a-contextual and a-historical)	perpetually changing	historicity (contextual and historical)
Human nature	deterministic	voluntaristic	duality of structure
Type of methodology	nomothetic inductive and deductive	idiographic emergent and grounded	idiographic but not relativist cooperative
		interpretive	emergent
			mutual understanding and consensus
Habermas [Ngwenyama, 1991:272]	**Rationality**	instrumental	dialectic	communicative
	Spheres of culture*	theoretical sphere of science	aesthetic sphere	practical sphere of morality and law**
	Validity claims	truth	sincerity	normative
	Knowledge interests	technical		emancipatory and practical***
Perspective	etic (outsider)	emic (participant)	emic empathetic or critical
	value free	not value free	not value free

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*From Kant's faculties of reason [Braaten, 1991: 15-16]

**This ontology will embrace all three spheres of culture, validity claims and knowledge interests. However the practical sphere is unique to the social world.

***Ngwenyama [1991: 272] classified the emancipatory knowledge interest as inner-subjective and practical knowledge interest as shared subjective. Held [1980: 317-319] also discusses emancipation as associated with "*self-understanding and autonomy of action*" and reflection but says that there is some ambiguity and evidence of a change in Habermas' thinking regarding the emancipatory interest. This can now be seen as addressing or correcting domination, which is a systematic distortion in communication between people. Emancipation, as seen in terms of Systems Development, and the application of Critical Theory in action research, seems to be more Intersubjective. Note that *Knowledge and Human Interests* was an early work and many of the concepts in it have been substantially revised.

Table 2.5: Information Systems Research methodologies associated with strategies

Research strategy	Positivist	Interpretive (Hermeneutics)	Critical (Hermeneutics)
Epistemology	positivism	anti-positivism	anti-positivism
Type of research goal	prediction and control	understanding	emancipation
Research outcomes	laws	models	emancipatory models
	hypotheses	frameworks	emancipatory frameworks
	theorem proofs	new concepts, insights, or theories	new emancipatory concepts, insights or theories
	tools	new applications	changed organisation or system
	IS instruments		
	techniques		
	methods		
	application of models		
Methodology	measurement	participant observation, discussion, and textual analysis	critical observation and textual analysis particularly of power structures, discussion, and intervention
Examples of methodologies	hypothetico-deductive experiments	interpretive case study, action research, holistic ethnography	interpretive case study, action research, critical ethnography, phenomenology

Table 2.6: Information Systems research methods associated with methodologies

Methodology	Empirical			Non-empirical
	Positivist	**Interpretive and Critical**		
	measurement	observation, discussion, and possibly intervention		conceptual
Research environment	laboratory field	field study		researcher or research group
Data type	largely numeric	largely text		ideas
Data collection processes and sources	Observe[*]: Case studies and surveys Experiment: Field and lab experiments, action research, simulation			Review[**]: Literature and experience
	lab experiments, field experiment, survey, simulation case study[***], action research[***]	case study [****], action research [****], ethnographic study, phenomenological study		thought experiments
Instruments	**Positivist**	**Interpretive**	**Critical**	
	measurement, counting, induction, deduction	interviews, questionnaires, formal and informal documentation	interviews, questionnaires, formal and informal documentation, participant observation	reflexive, discourse, induction
Data analysis & synthesis	quantitative statistical	qualitative hermeneutics	qualitative critical hermeneutics grounded	conceptual

[*]These entries apply to both of the empirical methodological groups. Galliers includes as part of his framework an "*orthogonal relationship between research philosophy and method*". The research philosophies are given as Positivist, Interpretivist [sic] and Critical [Galliers, 1997:153].

[**][Galliers, 1997:153]

[***]Case studies and action research can be positivist, interpretive or critical [Klein & Myers, 1999]. Positivist case study and action research are undesirable although possible. For example, groups of students can be used as subjects in a controlled lab experiment to carry out tasks that are emulations of those of systems analysts, managers or some other group, in an attempt to measure responses.

[****]As for footnote ***, but instead of simply observing, the researcher actively seeks to influence outcomes.

These criticisms arose largely because the framework was interpreted as rigidly classifying research approaches as inevitably being positivist or anti-positivist. There are a variety of factors to be taken into account before deciding whether a particular research method is positivist or not, such as the type of data collected and the methods used to analyse the data. The second (Table 2.5) and third table (Table 2.6) are, therefore, presented simply as guidelines. Galliers and Land [1987] classified Information Systems research approaches according to the social grouping that they could effectively be applied to, namely, whether they were appropriate for studying systems at the level of the individual, organisation or society as a whole. They also tried to indicate for each of these research activities whether they incorporated technology and/or methodology. Neither of these elements have been reflected in the framework provided above.

However, nominalist and socially constructed reality can be related to individuals and groups (organisations or society) respectively. Galliers has revised his original taxonomy slightly. The original Galliers taxonomy [Galliers & Land, 1987] was grouped into "*modes of traditional empirical approaches*" and "*modes of newer approaches*" but was subsequently altered to "*modes for traditional positivist approaches (observations)*" and "*modes for newer post-positivist approaches (interpretations)*" (Galliers [1997: 151] referring to [Galliers, 1993:96, 1994:97])

Since then Galliers has reconsidered the matter completely and suggests [Galliers, 1997: 153] that it is too simplistic to try to classify research methods as belonging exclusively to one or other philosophical research strategy. Different approaches could possibly be used at the different stages of research where the two main stages are data gathering (observation, review and experimentation) and distillation (analysis and synthesis). Myers [1997: 240] also has misgivings about tying methodologies to epistemologies. Galliers still stresses that it is essential to clarify the underlying philosophy of the research undertaken [Galliers, 1997: 142].

2.6.3   Information Systems as an emerging discipline

The epistemology adopted by researchers should influence their choice of research method - although theory and epistemology (paradigm) under-determine method (that is, there will still be a choice of methods and other factors will also influence this choice) [Mingers & Brocklesby, 1996]. The type of subject being researched is one of these factors. This then leads us to consider what types of subjects are generally the focus of Information Systems research and what methodologies are used.

The classic discussion on the nature of Management Information Systems (MIS) by Banville and Landry [1989], *Can the Field of MIS be disciplined?,* gives a classification of "intellectual fields" that was derived from Whitley's model using three dimensions, namely functional dependence, strategic dependence and strategic task uncertainty. Functional dependence analyses how

coherent the discipline is in terms of the way in which knowledge builds on previous knowledge and also how much standardisation there is regarding methods and ways of presenting findings. Strategic dependence examines the social or political factors within the discipline, such as competition for research funds, influence of practioners on the field and the degree of agreement regarding which aspects of the field are important. Strategic task uncertainty measures the stability of research focus. According to this schema, Management Information Systems was determined to be a fragmented adhocracy with a high degree of task uncertainty (rapid turnover of research topics), low degree of strategic dependence (funds are generally available and hence the competition for funding is not very fierce) and low functional dependence (the newness of the field, interdisciplinarity and flexibility resulting from the other two factors result in a lack of set standards and progressive work on clearly demarcated research directions). Hence, "*[R]esearch is rather personal and weakly coordinated*..." [Banville & Landry, 1989: 56]. This does not, however, mean that the discipline is not justified as an independent and quite well established field of intellectual endeavour.

It seems likely that a certain degree of maturity is developing in the field of Information Systems in comparison with ten years ago when this article was published. This is evident in at least a degree of acceptance of the view of Information Systems as a social science, a move away from quantitative research and a growing body of publications soundly based on social theory [Avison, 1997]. The multi-disciplinary character of Information Systems remains central to it. This means that there is a need for a flexible approach to teaching (curriculum design and teaching model) [Avison, 1997; Spaul, 1997] and research, along with solid understanding of the theories and developments in associated disciplines [O'Donovan & Roode, 2001; Jones, 1997] and the development of a theoretical base specifically for Information Systems. The discipline also continues to evolve, subject as it is to forces within its context of significance and cultural structure [O'Donovan & Roode, 2001]. On the less reassuring side, the immense growth of demand for IT related vocational training, together with the dynamic nature of the technology itself, has meant ever increasing teaching loads on lecturing staff and less time for research and serious consideration of underlying issues.

Methodological pluralism in both Information Systems research and Information Systems development is both a symptom and outcome of the fact that Information Systems is a fragmented adhocracy. In general it seems to be accepted that this is not only acceptable but largely desirable [Hirchheim et al, 1996; Mingers & Brocklesby, 1996; Jackson, 1992:88; Landry & Banville, 1992; Orlikowski & Baroudi, 1991; Banville & Landry, 1989: 56]. It is also useful to combine more than one approach within a single research project in order to use triangulation to confirm findings. Kaplan and Duchon [1988] give an example of such a pluralist or mixed method approach. The two authors, more or less independently, followed a qualitative and a quantitative research approach into the same research circumstances. The insights obtained from the two

approaches were very different, and neither could reasonably have been expected to be obtained from the alternate approach but together they provided a more complete understanding. Similarly Trauth and Jessup [2000] used a combination of quantitative and qualitative research, finding that well chosen combinations complement one another.

2.7   Habermas and Information Systems Research

2.7.1   Epistemology

What aspects of Habermas' thinking are applicable to the field of Information Systems? First of all, Information Systems is now explicitly recognised as being a social science and hence it makes sense to look to social theory for a theoretical basis. As a modern theory of societal rationalisation Habermas' critical theory of society meets this first requirement.

Habermas identifies three human knowledge interests, namely the Technical Knowledge Interest, applicable to scientific knowledge and technology and hence to the technological facets of Information System; The Practical Knowledge Interest related to social consciousness and humanity; And Emancipatory Knowledge Interests to do with norms of justice and freedom. Both Ngwenyama [1991] and Hirschheim and Klein [1989] have related these to Information Systems research and development. However, the book *Knowledge and Human Interests* to which these authors refer was written in 1968, and Jablonsky [1991: 298] indicates that the concepts have evolved to an extent where it is no longer valid to refer to these early writings. Hirschheim, Klein and Lyytinen [1996] used the earlier concepts as well as the Theory of Communicative Action to create an extensive framework for Information Systems development. Thus the earlier ideas have not been abandoned but simply revised and the underlying issues are still relevant to our field. They are included in the concept of communicative rationality as truth claims, normative validity claims and aesthetic validity claims. These were discussed in Subsection 2.3.3.3.

A second, independent, epistemological issue that is directly relevant to Information Systems research and development is that of positivism. Habermas is highly critical of the point of view that the social sciences, and in this case Information System, must be treated as natural sciences and hence that only positivist research is valid. But "*... does not argue that it is never appropriate to study human subjects with the methods of a causal, nomological science. Rather the claim is that a science that restricted itself to this procedure would - by itself- be incapable of understanding social reality.*" [Held, 1980: 307].

2.7.2   Theory and Practice

Habermas' refers to theory and practice in two different contexts. Firstly, in social research where the theoretical (or metatheoretical), methodological and empirical levels [Braaten, 1991: 77] are used by the critical theorist to study society. And secondly, as communicative rationality which incorporates theoretical rationality, practical rationality and the rationality of "authentic" self-expression in the every day functioning of society ultimately leading to the evolution of a more rational society [Spaul, 1997: 77]. Lyytinen and Hirschheim [1988: 23] identify two of Habermas' five forms of argumentation [Habermas, 1984: 23], namely theoretical discourse and practical discourse, as being the most important for Information System. It is important to note the meaning of these two terms. Theoretical discourse is the form of argumentation used to examine controversial truth claims in the cognitive-instrumental realm or objective world. Practical discourse is used to validate normative truth claims and hence is practised in the intersubjective world.

Ngwenyama [1991: 269] says that all critical social theory views theory and practice as being inseparable. This view contributes significantly to Habermas' anti-positivist stance, even with respect to the natural sciences, as it means that, "*... science cannot be fully comprehended merely as a formal abstract system, but must be understood as a product of concrete social activity.*" [Held, 1980: 306]. Hence, in the social sciences, research cannot only take place in a laboratory under controlled conditions and cannot consist simply of discovering laws that regulate behaviour. Information Systems is an applied science and hence, whether we are studying existing information systems or developing them, we need to focus on both theory and practice.

The theoretical framework provided by Habermas, particularly in the Theory of Communicative Action, but in the entire body of his work has been used by academics in developing Information Systems theory. It forms the basis for both research and developing information systems [Hirchheim et al, 1996; Mingers & Brocklesby, 1996; Jackson, 1992; Ngwenyama, 1991; Hirschheim & Klein, 1989] and justifies the very existence of the discipline of Information Systems [Jones, 1997; Spaul,1997]. Habermas' work can also be used in a very practical way in the development of systems [Dahlbom & Mathiassen,1995: 254; Lyytinen & Hirschheim, 1988] and in designing and carrying out the practical part of research [Lacity & Janson, 1994; Klein, Hirschheim & Nissen, 1991].

There is need for a close interaction between theory, practice and academic research in Information System, as there is in all disciplines which can be labelled "applied sciences". In fact at times it is difficult to differentiate between Information Systems research and development of

information systems (particularly when action research is being undertaken). Orlikowski and Baroudi make the point, "*Indeed, a major goal of information systems research is to have an impact on information systems practice; that is, the findings of information systems research are intended to inform and improve the development and use of information systems in organizations." [1991: 11]* Every information system is unique and hence something can be learned from every development exercise. Various authors have called for the interaction between Information Systems practioners and academics to be increased and strengthened [Avison, 1997: 129; Galliers, 1997: 146].

2.8   Giddens and Information Systems Research

Structuration theory has been used as a theoretical basis for a number of highly regarded research projects in Information Systems. Amongst these are those carried out by Barrett, Sahay and Walsham [1996], DeVilliers [1995], Orlikowski [1996; 1993; 1992; 1991], Majchrzak [2000] and Walsham and Han [1991]. In general the research which has been undertaken with Structuration Theory has used Orlikowski's model of the duality of technology, and Adaptive Structuration Theory [DeSanctis & Poole, 1994], as its basis. The research has described the duality of structure in terms of institutional structures, in which computing and information technologies are highlighted as resources, and the system. Problematic areas in this use of structuration can arise from the material nature of computer-based information systems, as structures, in Giddens' terms, are 'traces of the mind' [Jones, 1999]. This has led particularly to criticism of Adaptive Structuration Theory as being directly contrary to Giddens' principles because it is a contingency-type model which is used largely for positivist, experimental studies [Jones, 1999: 124].

There seem to be fewer research projects that refer particularly to Giddens' more recent writings [2000; 1990] (and Giddens and Pierson [1998]) in which he confronts the problems of late modernity including the effect of technology on it. Walsham and colleagues [Barret, Sahay & Walsham, 1996] have explored links between information technology and social transformation with reference to Giddens.

2.9　　　　　　Choice of paradigm for this research

2.9.1　　　Choice with reference to the research framework

The design for this research will be described in detail in Chapter 7. A brief outline is given here in order to justify the choice of research paradigm. The research carried out for this thesis involved studying the way in which first year Informatics students at a university develop a shared understanding of the concepts which they need. As the main research goal was to understand whether e-mail can be used successfully by students, working in culturally homogeneous groups, on tasks and projects which require them to construct meaning, it was recognised that this research should be anti-positivist and should use both quantitative and qualitative data.

In order to develop such an understanding it was essential to obtain a rich description of the educational environment and the students' views of that environment. In such an environment there are several units of analysis embedded within one another [Yin, 1989]. In this case there are two, the individual and the team. Students were to be studied as individuals and would complete questionnaires. The large quantity and numeric nature of the data, the single time-slice aspects of the collection of this data and the ways in which the data would be analysed are all indications of positivist, quantitative research at this level. Despite the fact that this aspect of the research is predominantly descriptive, it is interpreted from a cultural and contextual perspective allowing it to be considered, at least in part, interpretive [Orlikowski & Baroudi, 1991]. Students, however, were in teams, and the attempt to determine the nature of the sharing of meaning over a period of time within the team forms the qualitative part of the research. There were not many teams, the data is textual or spoken, the method of analysis had to be hermeneutic and required an understanding of context.

Examples of the kinds of questions that were posed are:
- Whether there was evidence that first year students improved their understanding of basic Informatics concepts during discussions when they worked on assignments in teams.
- To what extent this was evident in virtual teams.
- How the students chose team members and how this would affect the efficacy of the team.
- To what extent the learning environment would affect the feasibility of such a study.
- How the students interpreted the learning environment.

A full set of the research questions is given in Appendix E, together with a summary of the findings.

(In order to make it easier to refer to, Table 2.4 is now repeated as Table 2.7 but the Objective and Subjective columns are omitted.) The intersubjective nature of the research was clearly identified as it was focussed on forms of communication and learning. In Table 2.7 it can be seen that methodological pluralism is appropriate. The related view of an understanding of knowledge is contextual and historical and human nature both affects and is affected by social structures (duality of structure). Communicative rationality is essential in order to achieve genuine learning. Again referring to Table 2.7, this is all consistent with the Intersubjective view.

Table 2.7: An extended scheme for analysing assumptions about the nature of social science for the Intersubjective view only

		Intersubjective (Social)
Ontology		**Socially Constructed Reality**
Epistemology		methodological pluralism
		prediction, control, explanation and understanding
		prescriptive and descriptive
		the full spectrum (contextual and historical)
Human nature		duality of structure
Type of methodology		idiographic but not relativist
		cooperative
		emergent
		mutual understanding and consensus
Habermas [Ngwenyama,1991 : 272]	**Rationality**	communicative
	Spheres of culture[*]	practical sphere of morality and law
	Validity claims	normative
	Knowledge interests	emancipatory and practical
Perspective		emic empathetic or critical
		not value free

[*]From Kant's faculties of reason [Braaten, 1991: 15-16]

Critical hermeneutics would be required to interpret not only the data collected but the influence of the environment or context on the individual and vice versa. The research was intended to be critical (in the sense used by Myers [1997b] and explained in Section 2.4.3, that is, with no preset agenda). It was foreseen that the diverse groups (different cultural groups of students and groups with different status - represented by the students and lecturing staff) would have different and sometimes conflicting interests. However, the research goal is not unilaterally emancipatory.

The main purpose of the research, as noted at the start of this section, was a detailed understanding of both the context and the particular process of constructing meaning. According to the second part of the research framework, Table 2.5, this is a hermeneutic research strategy. This table is repeated as Table 2.8 retaining only the essential columns. Observation (as a participant but also in case of the face-to-face teams as a detached observer), discussion, textual analysis and intervention were seen to be suitable methodologies. The use of an interpretive case study together with action research was considered to be appropriate (noting that Klein and Myers [1999] and also Jönssen [1991] specifically allow for interpretive action research and not only critical research).

Table 2.8: Information Systems Research methodologies
associated with Hermeneutic strategies

Research strategy	Interpretive (Hermeneutics)
Epistemology	anti-positivism
Type of research goal	understanding
Research outcomes	models
	frameworks
	new concepts, insights, or theories
	new applications
Methodology	participant observation, discussion, and textual analysis
Examples of methodologies	interpretive case study, action research, holistic ethnography

Thus, it was appropriate to carry out a single, in-depth case study using action research. The research is generally empirical, although literature has been reviewed. The researcher has drawn on her own experience and that of other lecturers, and reflection and discourse have been used to probe the ideas (hence non-empirical methods have also been used). The data sources indicated in Table 2.9 as appropriate for interpretive research were used. Instruments considered suitable for data collection were interviews, questionnaires and documentation. In the actual research, use was made of recordings of discussions and this indicates that not all observation was as a participant but that the lecturer participated to some extent in the e-mail discussions. According to Table 2.9 this use conforms with an empirical study, using an interpretive methodology. The research qualifies as an intensive field study with the data source being action research. The instruments used to collect data are appropriate for this type of study and the analyses done in Chapters 8 and 9 will also be according to the framework.

Table 2.9: Information Systems research methods associated with empirical methodologies

Methodology	Empirical	
	observation, discussion, and possibly intervention	
Research environment	field study	
Data type	largely text	
Data sources	Observe: Case studies and surveys Experiment: Field experiment, action research, laboratory, experiment, simulation	
	case study, action research, ethnographic study, phenomenological study	
Instruments	**Interpretive (Hermeneutics)**	**Critical**
	interviews, questionnaires, formal and informal documentation	interviews, questionnaires, formal and informal documentation, participant observation
Data analysis & synthesis	qualitative hermeneutics	qualitative critical hermeneutics grounded

2.9.2 Preliminary research plan

2.9.2.1 Anti-positivist

- The research would be carried out by interacting with a real social unit rather than in a laboratory setting and hence it would clearly not be positivist research but action research. Jönssen [1991] quotes Argyris et al [1985: 237] as follows, "*Action research is when scientists 'engage with participants in a collaborative process of critical inquiry into problems of social practice in a learning context' . The main feature of action research is that it is 'expressly designed to foster learning about one's practice and about alternative ways of constructing it' "*. Hence although there is no specific client or contract in this case the proposed research is considered to be action research.
- No attempt would be made to create a matched control group or to identify dependent and independent variables. (The reasons for this will be discussed in detail in Chapter 7, but briefly it was believed that, for ethical reasons, students should be allowed to decide for themselves which study option they wished to use.)
- No specific hypotheses would be set up prior to the research.
- The research would not make use of a single time slice but would be carried out over a period of about eight weeks.

2.9.2.2 Collaborative

- The lecturing staff of the university, the students, and the researcher would all be involved in decisions regarding how the research would be done. In particular, students would be allowed to decide for themselves whether they wanted to participate and to what extent. This would, therefore, be a collaborative effort between the researcher and other stakeholders and a variety of opinions would be actively sought.
- Every effort would be made to make it clear that those who participated would use a learning model which differed from the one that they were in all likelihood accustomed to and hence they would be involved in a process of change.
- The research environment was clearly complex as nearly one thousand six hundred students were registered for the module, three different study options were to be offered, three different lecturers would be affected and this would all occur during the normal schedule for the semester.
- A great deal of uncertainty was inevitable. There would be no way of predicting how many students would choose each of the study options.
- The researcher would be an active participant and not an unbiased observer.

2.9.2.3 Study options

- Students could elect to work as face-to-face teams during scheduled lecture periods.
- Others could elect to work as face-to-face teams but during times which they scheduled according to their own convenience.
- The final group could work as virtual teams, communicating via e-mail.

2.9.2.4 Data sources

- A large amount of data would be collected from different sources. The data collected was expected to be a mixture of text (from the interviews, recording of face-to-face team discussions and e-mail, and open questions on the questionnaires), and quantitative data (from part of the questionnaires).
- The face-to-face teams who chose to meet outside class would be required to record their work sessions (audio only).
- All the students would complete questionnaires before and after completing the assignments.
- In addition a number of semi-structured interviews would be carried out.

2.10 Conclusion

In Section 2.6 of this chapter a research framework was developed consisting of three parts, namely,
- An extended scheme for analysing assumptions about the nature of social science;
- Information System research methodologies associated with research strategies;
- Information System research methods associated with methodologies

As was noted, there are inherent dangers in developing such frameworks as they might give the impression that there is a fixed and generally agreed set of rules which specify that certain instruments, data sources, methods of analysing data or research environments may only be used in order to arrive at particular research goals, outcomes, and methodologies. In fact this is not the case. Another obvious problem with the set of frameworks presented in this chapter is their complexity. The frameworks were developed as a summary and to help Information Systems researchers to obtain an overview of how various elements may be used. The relationships between these elements is intended only as one possible configuration.

Researchers need to associate theory and the initial research design and data collection processes during the actual collection and analysis of data and to present this as part of the final product of the research [Walsham, 1995]. It is hoped that this set of frameworks will be useful in creating links that are consistent in terms of underlying philosophies. The set of frameworks was used in planning this research, as is explained in Section 2.9.

The broad context of Information Systems as an emerging discipline, and as projected by the types of research undertaken, was used in order to verify aspects of the frameworks in an informal way. Support for the use of more than one methodology was provided as evidence of the acceptability of a pluralist approach and examples (from an important body of reputable research that use the same theoretical bases as will be used in this research) are referred to. An honest effort has been made to identify a research perspective that is compatible with the research and the researcher's own beliefs and outlook.

> "*What is required is that researchers understand the implications of their research perspective, and act in ways that reflect that knowledge. ... researchers should ensure that they adopt a perspective that is compatible with their own research interests and predispositions.*" [Orlikowski & Baroudi, 1991: 24]

An important outcome from this chapter is derived from the discussion of Habermas' Theory of Communicative Action. The concepts summarised in Figure 2.1 are used in the action research to analyse the discourse by the student teams. This is presented in Chapter 9.