Computer-mediated interpretation of risk

The introduction of decision support systems in a UK retail bank

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Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy at The Judge Institute of Management Studies, University of Cambridge, 1998.

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration.
Computer-mediated interpretation of risk: the introduction of decision support systems in a UK retail bank

Abstract

This dissertation examines the consequences of introducing a computer-based decision support system into corporate loan risk assessment within a major UK retail bank. The findings are based upon a longitudinal case study conducted between 1993-1996 using an interpretive methodology.

It is suggested that information and communication technologies highlight and accentuate some of the most important characteristics of the era in which we live. Organizations need to think beyond the formal-rational logic that dominates the management literature if they are to appreciate the complex, and sometimes contradictory, consequences that are likely to emerge when computer-based technologies interact with their context.

Decision support tools, based on historical data and quantitative models, only present a partial view of organizational data. It is proposed that a hermeneutically-informed, interpretive approach is a useful way of understanding this and reveals important considerations with regard to the design, development, implementation and use of these technologies.

Drawing on the case study and this interpretive approach, the thesis considers the formulation of strategy in practice. The strategic use of the Lending Advisor decision support system is then considered against the novel theoretical 'backcloth' of Ulrich Beck's risk society thesis. The theoretical context of a hermeneutically-informed risk society enables a re-conceptualisation of middle management which contributes to our understanding of the impact of technologies like Lending Advisor and their role in the transformation of modernity.
‘The real trouble with this world of ours is not that it is an unreasonable world, nor even that it is a reasonable one. The commonest kind of trouble is that it is nearly reasonable, but not quite. Life is not an illogicality; yet it is a trap for logicians. It looks just a little more mathematical and regular than it is; its exactitude is obvious, but its inexactitude is hidden; its wildness lies in wait.’

G.K Chesterton
Acknowledgements

Grateful thanks, first of all, to my supervisor Professor Geoff Walsham for his guidance and support. For teaching me about research as part of the human journey and setting goals for me to work towards. Also, my second supervisor Dr Elizabeth Garnsey for her sensitive intellectual rigour and insightful comments which helped me craft this dissertation.

I'd like to thank my comrades at The Judge Institute (1993-1996) Seamas Kelly, Michael Barrett and Sundeep Sahay for their friendship, wit and encouragement.

Sundeep Sahay and Wanda Orlikowski were kind enough to read the draft of this thesis. Their time, effort and excellent comments were most appreciated and helped develop my thoughts further.

A special thank you to Edgar Whitley for his kindness, and to all at the LSE Information Systems Department for their patience during the write-up of this dissertation. Thanks to John Roberts and Matthew Jones at The Judge Institute for their support during some of the more 'interesting' moments in the research process. Also to Hugh Willmott (UMIST), my external examiner, for making the viva process a learning experience.

Thanks to Boise State University where I spent many hours working in the library gazing in appreciation at the river and foothills beyond my books. A particular thank you to Phil Fry, Rob Anson and Matt Maher in the BSU College of Business.

This thesis is dedicated to Walter Hartman Scott, my husband, my best friend and critic. Thank you for your strength and sense of humour - you are just wonderful.

Also in grateful appreciation of 'The Team', Michael and Valerie Darking. For always being there with love, support and patience that I did not always deserve. Thanks for everything. I still have a lot to learn, you know. In the middle of this degree process I had the good fortune to embrace a new family, the Scotts, who extended warmth, generosity and love to me in a way I shall never forget.

And finally, a prayer for Bertha Sellers and Leon Scott Sr., both of whom encouraged me so much. Their memory will always be an inspiration to me.
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Part One

Chapter One  Introduction
Briefly defines key words:
UK banking, information systems, decision support systems, interpretation
Introduces key concepts underpinning the dissertation:
Multiple interpretations in the context and process of organizational change
The informing capacity of computer-based information systems
The reflexive relationship between a human agent and their communities

Chapter Two  Critical literature review
Critically reviews relevant literatures:
UK retail banking
Risk assessment
Computer-based decision support systems
Interpretation and hermeneutics in information systems research

Chapter Three  Research approach and methodology
Describes and discusses interpretive research approach
Relates research approach to epistemology and locates it within the spectrum of
information systems research approaches
Outlines and discusses qualitative method

Figure 1.0  Summary of Part One
Chapter One

Introduction

This thesis considers the consequences of introducing computer-mediation into key work processes relating to the interpretation of risk. The focus of this research is the introduction of a computer-based decision support system into corporate loan risk assessment within a major UK retail bank. The findings are based upon a longitudinal case study conducted between 1993-1996. The first section of this introductory chapter considers, at a general level, why it is important to study computer-based information and communication technologies in organizations and raises some concerns about the use of decision support systems.

The second section provides an overview of the thesis (Figure 1.1 on page six), and introduces the key background concepts and terms underpinning in the thesis. Three main concepts are discussed. Firstly, it is suggested that a hermeneutically-informed, interpretive approach reveals important considerations with regard to the implementation and use of these technologies. Computer-based decision support tools based on historical data and quantitative models, present only a partial view of organizational data. Organizations need to consider carefully the potential limitations and restrictions that they could be putting on their activities in the market.

Secondly, it considers the social and organizational issues related to the unique nature and ‘informating’ capability of computer-based information systems. It is argued that information and communication technologies highlight and accentuate some of the most important characteristics of the era in which we live. Organizations need to
think beyond the formal-rational logic that dominates the management literature if they are to appreciate the complex, and sometimes contradictory, consequences that are likely to emerge when computer-based technologies interact with their context.

Finally, it is suggested that introducing computer-based decision support systems into loan assessment, may transform the traditional concept of risk in retail banking. Further, it is argued that by exploring the structure of market-based risk we can better understand the way in which risk has become generalised in our everyday decision-making. The thesis proposes that the emergence of this ‘risk culture’ is symptomatic of a process of globalisation which has important consequences for individuals, organizations and societies all around the world.

The chapter concludes with a brief outline of the structure of the thesis.

1.1 Information systems research

This thesis is concerned with computer-based information systems (IS) and, within this general area, a phenomenon known as decision support systems (DSS). The many definitions of information systems reflect the multi-disciplinary character of research in this field. Much research effort has, of course, been conducted on the technology itself and numerous technology-focused definitions exist. For example, Ein-Dor and Segev (1993) state that: ‘any computerized system with a user or operator interface is an information system, provided the computer is not physically embedded.’

However, this thesis aims to understand computer-based information systems in the context of organizations and their impact on broader social developments. Angell and Smithson (1991) offer a useful, less technologically oriented starting point for this particular research focus in their definition of information systems: ‘Information systems are social systems whose behaviour is heavily influenced by the goals, values and beliefs of individuals and groups, as well as the performance of the technology. As such, the behaviour of information systems is not deterministic and does not fit into any formal algorithmic representation.’
Information systems can be thought of as a ‘litmus test’ for the health of an organization. They provide a focus for how we attempt to organize ourselves: how we frame problems, how we then choose to deal with them; how we manage the consequences of those choices. Computer-based information systems are viewed here as an embodiment of social and political interests, a resource drawn upon by different actors in various ways. As such, they are an important area of research.

Decision support systems represent a collaboration between operational research and management information systems. As will be discussed in the critical literature review, certain kinds of decision support systems, including the one in this study, also have an advanced modelling component for 'decision guidance' (Silver 1990) derived from artificial intelligence research. DSS are understood in this thesis as a mechanical intervention in nature; a foray into the unknown area of human thought processes and situated knowledge. In some respects decision support systems embody the ‘empirical test of the rationalist tradition’ so ravaged by the work of Herbert Dreyfus (1979). The speed and scope of their current commercial success, particularly in the financial sector, coupled with these problematic intellectual debates, makes them a particularly interesting area for research.

Once again, definitions abound and many focus primarily on the technology. Since the emphasis of this research is on understanding the complex consequences that emerge from the introduction of decision support systems in a specific context, rather than a prescription for technological design, it was felt that a broad definition, such as Silver’s was the most useful. This definition will be discussed further in the literature review, but for the purposes of this introduction: ‘A decision support systems (DSS) is a computer-based information system that affects or is intended to affect how people make decisions’ (Silver 1990).

The use of computer-based information and communication technologies are having a significant influence on the ‘scope, intensity and speed of social changes’ in most parts of the world (Giddens 1991). Indeed, the radical impact of computer-based information and communications technologies on modern western society has been compared to that of the printed text. Together with the printed text, they can be
regarded as modernity's 'own media', bound up in the development and expansion of modern institutions and increasingly mediating our experience of the world, especially certain important social and economic exchanges (Giddens 1991), like the risk assessment of loan applications.

It is therefore important to look beyond the commercial hyperbole and popular visionary images to try to understand the potential impact that computer-based information technologies might have on our society. This research represents an attempt to explore the complex social processes and themes raised by computer-based decision support systems. The aim is not just to develop our understanding of computer-based information systems in organizations, but also to consider the broader context and processes that they mediate in society.

1.2 Key concepts and terms

This section provides an overview of the thesis (Figure 1.1), introduces some key concepts and terms. Although a number of preliminary research questions (Chapter Three) were formed to guide the case study, the sustained focus of this dissertation was to study what happened when a traditionally manual decision-making process within an organization became mediated by a computer-based information system. The overall premise of the thesis was that computer-based information systems both enable and constrain change within organizations.

The focal level at which this was explored was a case study documenting the introduction of a computer-based decision support tool, called Lending Advisor, into risk assessment of corporate loans in a UK retail bank, which for reasons of confidentiality will be known as UK Bank. Lending Advisor (LA) is a leading edge information system, the first of its kind to be introduced to corporate market risk
Overall premise
Computer-based information systems both enable and constrain change within organizations

Focal level
The introduction of DSS into corporate loan assessment

Epistemology
Hermeneutics: multiple subjective interpretations of reality

Methodological approach
Exploration of context and process of organizational change

Method
Longitudinal case study

Case study
Lending Advisor computer-based decision support system in UK Bank

Analysis in local context
Lending Advisor in UK Bank: strategy formulation in practice

Analysis of management and use issues
How technologies like Lending Advisor enable and constrain organizational change: issues for management

Analysis of implications for society
Situated decision making: implications for the transformation and generalisation of risk in a globalising society

Conclusion
Summary
Further implications
Reflections on methodology
Conclusion

Figure 1.1 Summary of the thesis
assessment in the UK. As such it represents an important opportunity to learn about decision support systems in the context of retail banks, and indeed the UK banking sector is watching with interest. There are three key concepts that underpin the thesis and they will be introduced in the following sub-sections in order to help the reader ‘navigate’.

1.2.1 Multiple interpretations

The concept of multiple interpretations reflects both the hermeneutically-informed epistemology underlying the thesis and its interpretive methodology. An interpretive approach reveals important considerations with regard to the design, development, implementation and use of technologies like Lending Advisor for the following reasons. Lending Advisor presents one interpretation of organizational data, a partial view, based on historical data and quantitative models. At the heart of computer-based decision support systems design is the highly rational, bounded logic of computer science. This means that it is critically important that designers and organizations consider the appropriate application of computer-based decision support systems. By introducing these kinds of expert systems, organizations need to consider carefully the potential limitations and restrictions that they could be putting on their activities in the market.

Traditionally management science has itself been dominated by a formal-rational logic. This could prevent organizations from implementing computer-based support tools like Lending Advisor in the most effective way. It is suggested that Lending Advisor could be viewed, as one experienced manager put it, as a piece of ‘interpretive software’ to reflect a rational view which is then balanced out by the expertise of the user. In this role it could support an overall ‘learning culture’ within the organization. To UK Bank, this would represent a considerable shift in organizational culture. Will management be able to embed this concept in its organizational strategy and communicate it in everyday discourse? How will UK Bank balance out the need to retain expertise in the organization, with the need to rationalise in order to be competitive?
One approach to interpretation draws from the tradition of hermeneutics. The research approach in this thesis was strongly influenced by the work of Gadamer (1975) and Richard Boland (1987, 1989, 1996). During the course of the research it was discovered that hermeneutics, whilst providing some valuable insights, also had limitations. These will be briefly discussed in the conclusion of the dissertation.

1.2.2 The informing capacity of computer-based information systems

It is suggested, that due to its unique nature, computer-based information and communication technologies present us with both opportunities and risks. The word that has been coined by Shoshana Zuboff (1988) to express this capability is ‘informate’ and it was a key concept that informed the dissertation. Zuboff maintains that computer-based information systems ‘set in motion an entirely unique set of reflexive processes’ (Zuboff 1996) which disembled data from its local context of time and space. Computer-based information systems ‘render processes, objects, behaviors, and events so that they can be seen, known, and shared in a new way (Zuboff 1996).

This may lead to certain traditional norms and structures within organizations being challenged. Banking has been a deeply traditional sector in the UK and, in many respects, remained virtually unchanged for nearly two hundred years. The Lending Advisor project introduced computer-based information systems into the key work processes of loans managers for the first time. Their work had been characterised by a subjective component that many of them felt was very important, indeed, some of them described loan assessment as 'part art, part science'. Bank managers also tended to have a strong presence in local communities via UK Bank's extensive local branch network. How did Lending Advisor effect the culture within UK Bank and are work processes enacted differently when mediated by the decision support system?

Some of the opportunities and risks that emerged during the Lending Advisor project were intended by UK Bank, and others that have arisen were unintended. This is where longitudinal studies reveal such fascinating shifts in events. The most striking example of this in the study relates to the formulation and enactment of information
systems strategy. It is not clear that the executive management at UK Bank originally intended anything but a reduction of 'bad and doubtful debts' within UK risk management when they approved the Lending Advisor project. This was certainly how the business case for Lending Advisor was presented to the Board of UK Bank. By what process then, did Lending Advisor come to be described by a Lending Advisor Project manager as the 'Trojan Horse' for introducing changes in strategy that would destroy the old family hierarchies and formal traditions within the bank?

1.2.3 The reflexive relationship between a human agent and their communities

The case study in this thesis focuses on a computer-based decision support tool used to assess and evaluate the risk involved in corporate market bank loans. The likelihood of a loan defaulting is assessed by the decision support system, Lending Advisor, using quantitative methods and based on a wide range of attributes. The thesis develops the idea that human agents have a reflexive relationship with their communities by considering the notion of situated decision-making. It puts particular emphasis on how changing social, economic and political relations influence the interpretation of risk.

The financial model of risk in the UK is a traditional one stretching back hundreds of years to the time of the coffee shops on Lombard Street in the City of London. The dissertation will explore the impact of the Lending Advisor DSS on the process of risk management and contribute to our understanding of current changes in the nature of work. In particular, the implications of an increasing 'climate of attrition' for the decision-making by middle managers using Lending Advisor DSS will be considered.

1.3 The structure of the thesis

This section provides a guide for the reader through the structure of the thesis. The thesis is divided into four parts, summarised diagrammatically in Figure 1.2. The first part of the thesis consists of the introduction, critical literature review, research approach and methodology. The introduction has presented the key background concepts and terms in the thesis. The critical literature review will focus on four main
areas of literature which provide background for the case study: retail banking; decision support systems; risk; and hermeneutics.

Figure 1.2 Structure of the thesis

The Lending Advisor case study is presented in the second part of the thesis. It was conducted using an interpretive approach. The fieldwork design for the Lending Advisor research project was based around a longitudinal case study. The primary method for gathering data was extensive in-depth interviews with project stakeholders. When the case study began in 1993, Lending Adviser was in its pilot stage. Its development was followed through from initial implementation to ‘business-as-usual’ status, by which time a project team had been established to work on Lending Advisor II.

The third part of the thesis presents an analysis of the findings based on the case study. There are three substantial analysis chapters which constitute almost fifty per cent of the dissertation. The complex consequences surrounding the introduction of a computer-based information system into a ‘greenfield’ site during a time of extensive re-organization touch on many different theses and could be interpreted in countless ways depending on how one focuses on them. The dissertation selects certain themes which, it was felt, had the most potential for increasing awareness and contributing to IS theory and practice. These main areas are: the re-conceptualisation of strategy and
DSS considered against the novel theoretical 'backcloth' of Ulrich Beck's (1992) *Risk Society* thesis. The theoretical context of a hermeneutically-informed risk society enables a re-conceptualisation of middle management which contributes to our understanding of the impact of technologies like Lending Advisor and their role in the transformation of modernity.

Chapter Five considers the emerging role of the Lending Advisor project through the multiple interpretations of its project stakeholders. The consequences of its origins as a functional line initiative are explored. How does the Lending Advisor case relate to traditional rational notions of strategy formulation? Mintzberg's notion of strategy formulation in practice provides the foundation for a re-conceptualisation of strategy which, it is suggested, offers many insights that could inform action.

Chapter Six focuses on issues for information systems management that emerge from the analysis of the Lending Advisor case study in Chapter Five. It engages with, and develops, a number of issues in the information systems literature concerned with the implementation and realisation of organizational strategy. Further, the chapter considers how to maximise the potential benefits of introducing DSS technology by presenting a novel re-conceptualisation of DSS and the decision-making that it affects. Having embraced this 'other' concept of DSS and situated decision-making, the notion of a critical positioning of DSS in the corporate skill set is discussed.

A hermeneutic analysis of the Lending Advisor case study is proposed in which multiple interpretations of the future exist simultaneously within an organization, and are expressed via networks of power interests that form continually shifting alliances. This provides insights into the outcome of strategic IS project processes within organizations. It also enables an analysis of the strategic market position of UK Bank in which the capacity of computer-based information systems to disembed data from time and space, is critically examined in relation to specialised, local lay knowledge.

The last part of the analysis, Chapter Seven, focuses the reader at a different level in order to explore the potential consequences of this kind of technology beyond the bounds of the organization, for the individual, the sector, the economy and society.
Ulrich Beck's work (1986) on the social construction of risk and identity provides a theoretical context in which to explore the consequences of computer-mediated interpretations of risk. The Lending Advisor case extends Beck's vision of a 'risk society' by contributing an informed and updated understanding of the impact of information systems and their role in the development and expansion of modern institutions.

The findings in the case study are used to extend Beck's vision of the risk society, and in particular, his notion of the destandardisation of labour. The Lending Advisor research project contributes an informed and updated understanding of the impact of computer-based information systems. The study considers the competing conceptualisation of middle management and formulates a hypothesis to explain the contradictory findings in the literature.

It is suggested that a hermeneutically-informed conceptualisation of middle management helps us to understand their response to the introduction of technologies like Lending Advisor. There is a focused discussion of the changes in middle management work, as they relate to the Lending Advisor case. This examines the increasing personal and professional riskiness of such work and the implications of a shift in the balance of dependency, autonomy and expertise within UK Bank.

The fourth part of the dissertation, Chapter Eight, it presents a brief summary of the main areas of contribution: strategy formulation in practice; the re-conceptualisation of DSS; extension and development of the risk society thesis; and the re-conceptualisation of middle management. The four year study afforded many opportunities to reflect upon the research approach and methodology used. A few of the perceived strengths and weaknesses of the interpretive approach are briefly outlined. Finally, in appreciation of the others ways in which the Lending Advisor case study could have been analysed, and to express some ideas for follow-on research that arose in the course of this project, the chapter briefly outlines some areas for further research.
Chapter Two

Critical literature review

2.1 Introduction

This chapter is divided into five parts which critically explore relevant literatures on UK banking, risk, interpretation and computer-based decision support systems. This first section outlines the structure of the chapter.

The second section aims to provide a background for the developments and issues in the recent history of the major UK retail clearing banks. It is divided into six sub-sections which examine how the traditionally stable and paternalistic UK banking sector has found itself in the midst of radical transformation in the 1990's, and considers the role that computer-based technology has played in this process. The first sub-section discusses corporate lending, the area of retail banking into which Lending Advisor has been introduced. The next four sub-sections detail developments in the clearing banks during the following periods: the late 1950's and 1960's; the 1970's; the 1980's; and the 1990's. The various themes, issues and predictions made by researchers during these periods will be highlighted to show how concerns have shifted. The sixth sub-section outlines the technological developments in the 1990s and discusses the current focus of banking literature.

The third section reviews the evolution of risk management in the major UK clearing banks. It begins by outlining the traditional paper-based risk assessment process for corporate loans in UK Bank before Lending Advisor. It describes the situated, local nature of risk assessment undertaken by a local branch manager with its emphasis on prose based applications, and the subjective formality of the risk management
hierarchy within UK Bank. This method of risk assessment came to be seen as increasingly inadequate in recent years due to a perceived rise in levels of risk in the global environment (Bernstein 1996). The discussion of 'risk in an uncertain age' helps us to understand why the commercial world of banking would turn to academic theories to help them manage risk. Such theories form the basis for the design of decision support systems like Lending Advisor. These idealised quantitative models of risk are briefly discussed, and some questions raised about their highly rational nature and strategic role in banking. It is suggested that dependence upon rational forms of risk assessment may introduce new risks into the ecology of the financial world. In order to better understand this process, the concept of risk in other discourses is reviewed. This broadens our interpretation of the concept of risk while introducing certain issues and themes which are important for the development of this thesis.

Computer-based information systems with these academic models of risk embedded in them are understood here as only a partial view of relevant data and risk assessment. The next section considers how interpretive approaches and the theory of hermeneutics supports an important ‘reflexive learning process’ (Wynne and Lash 1992) through which the epistemology of such methods of risk assessment can be challenged and their weaknesses revealed for careful consideration. Hermeneutics is drawn upon in a particular way in this thesis and various approaches to the theory of interpretation are considered here. The discussion of hermeneutic approaches is then concluded with a brief review of its application to date in information systems research, focusing on the work of Richard Boland.

The last section in this chapter presents a working definition of decision support systems. This definition is based on the work of Mark Silver (1990), Systems that Support Decision Makers. Silver’s work provided a useful starting point for this study although, as will be discussed, it was felt that his research approach had to be somewhat modified. The literature review is then broadened to other relevant authors who helped to inform the themes in the thesis and provide a background for this study. This review concludes with some predictions regarding the potential affects of decision support systems found in the current literature.
2.2 The UK retail clearing banks

The aim of this sub-section is to provide a background understanding of UK retail banking. It begins with a brief historical overview, followed by a short description of the corporate loans market into which the Lending Advisor system was introduced in the mid-1990s. It is then divided into four sub-sections which are organised chronologically: late 1950s and 1960s; the 1970s; the 1980s; and the 1990s. These outline the main events that took place during these periods in UK banking and draw on a combination of academic, practitioner and media sources. Greater emphasis is put on the more recent period, mainly because until recently the speed of change in UK banking was slow; indeed, for the 100 years before World War II there was little change to key work practices with the major UK retail banks. In each sub-section, the significant events of the periods are discussed, followed by an overview of the technological developments that took place. The sub-section concludes with a review of technological development in the 1990s which aims establish the context for the Lending Advisor case study and consider the main themes and issues in the banking literature.

The current UK banking system traces its origins back to the early 19th century when joint stock banking was permitted by an Act of Parliament in 1826 (Goldie-Scot 1991). The UK banking sector has traditionally consisted of the following institutions: retail banks, discount houses, British merchant banks, and other British and overseas banks. However, since deregulation in 1986, new entrants have entered the market at a considerable rate, including building societies and non-banks like supermarkets. The centre of the British banking system is assumed to be in the City of London (although many processing and development functions are actually elsewhere in the UK) and the sector's development is inextricably linked with the development of London as an international financial centre (Child and Loveridge 1990; Goldie-Scot 1991).

Since the 1970's, retail banking has been dominated by the 'Big Four': Barclays, National Westminster, Lloyds and Midland; they handle the majority of the UK's cheque and credit clearing. This involves the transfer of funds from one bank to
another via balances at the Bank of England, necessary when payments are made between individuals or companies which bank with different banks (Pawley, Winstone et al. 1991). The retail clearing banks cater for corporate and personal loans, saving plans and money transmission. They also provide a range of other income producing services: leasing, unit trusts, credit cards, executor and trustee, investment and tax advice, share dealing and portfolio management, insurance and estate agency (Pawley, Winstone et al. 1991). It is the provision of such a wide range of products, complimented by their well established reputations (Egan & Shipley 1995), that continues to make the Big Four major forces in this market.

Banks have a key role in the economic development process in market-based economies by providing a conduit between savers and borrowers which, coupled with their ability to create credit and guarantee payments, has made them instrumental in both promoting and directing economic growth (Orton 1994). Banks also play an important role in society; the redistribution of surplus capital and provision of financial services is not only essential to corporations, but also enables everyday people to create and sustain the material fabric of their lives thereby facilitating the growth of communities.

In Britain, the local bank and the local bank manager have been important actors, embedded in a powerful local community network that included farmers, teachers and the clergy. The organizational changes that accompanied Lending Advisor were associated with the breakdown in this community role. Although this thesis focuses on the introduction of decision support systems into UK retail banking and the implications that this might have for the strategic direction of the case site, an important part of the study is a consideration of the wider economic and societal implications of computer-mediated relationship banking which is emerging in the UK. In the current highly competitive conditions it is not clear that the Big Four will survive in their present form. This thesis traces the attempts of one major UK retail bank to respond to one kind of threat to their existence: the assessment and management of credit risk.
2.2.1 Corporate lending

Within the activities of UK retail banks, the specific focus of this study is corporate banking. The market for corporate lending can be split into three broad tiers: small, medium-sized and large companies (Goldie-Scot 1991). Unlike the USA where venture capitalists play a significant role, in the UK small business loans have been very much the province of retail clearing banks and the branch manager has traditionally played a major role in providing both credit and advice to small companies. This sector was hard hit by the recession in the early 1990's and accounted for the majority of company failures during 1990/1991. The banks perceive lending to small business as a very risky enterprise and as a result interest rates and charges at this level are much higher. Because of this most banks are becoming increasingly selective in their small business lending.

The clearing banks also dominate the medium-sized company segment, traditionally the most profitable in corporate lending (Goldie-Scot 1991). It is important to note that, although its scope was subsequently extended, the Lending Advisor system was originally designed to support lending in the middle market. Competition in this market has been increasingly fierce, with the clearing banks' market share declining as a result of erosion by other UK banks and foreign banks. Most of the ‘Big Four’ lending tends to be to manufacturing industry and services industries, especially property companies, garages, hotels and catering (Goldie-Scot 1991).

In the large, and very large, company market the ‘Big Four’ have to contend with the established presence of foreign banks. One bank rarely provides all the services required by a very large corporation and syndicated or transaction banking involving a number of different banks is common practice. However, the complexity of the credit losses endured during the last recession convinced some large companies to pay slightly more and concentrate on developing a relationship with fewer banks. Due to the increased competition and collaboration between banks, profit in this market is not as high as for the small or medium loans market.
2.2.2 The late 1950's and 1960's

Historically, financial services operated in a highly regulated environment, where specialization was the norm and cross sector competition was limited. Banks focused on financing industry and providing money transmission facilities, and building societies were restricted to savings and mortgages. The two main areas of activity during the 1950's and 1960's were, firstly, retail banking for traders and the upper classes and secondly, domestic UK credit operations. There were limited international links at this time with international credit and foreign exchange operations playing a very small role. The market hold of the main clearing banks was considerable. British banks held over 85% of all commercial banking business in sterling in 1955 (Smith and Wield 1987). Competition was, therefore, minimal.

Head office functions tended to be centralised in London, but the major UK retail banks were characterised by an extensive regional branch network which was shaped by a historic pattern of mergers and acquisitions (Tuke & Gillman 1972). The branch network had lots of small branches and, as has already been mentioned, the local manager played a significant role in the surrounding community. The organizational structure in banks was typically hierarchical with many functional splits within the main sections. Much of the work in branches, particularly in the operations areas, was organized along scientific management lines (Hornby and Clegg 1992). This is a trend that would continue through to the 1980's.

During the 1960's, the major UK banks continued to expand their 'high street presence' throughout the UK. This local branch network structured the dynamic between the bank, the local community and its customers. As a result of this programme of expansion, employment within the UK banks grew by 60% in this decade and a job with a major bank was considered a 'job for life' (Smith and Wield 1987).

The most significant event in the 1960's for the major clearing banks was a flurry of mergers among the regional banks, and the referral of a proposed merger between three of the top five UK retail banks to the Monopolies Commission by the then Prime Minister, Harold Wilson. The proposed mergers were a progression of the high
degree of co-operation between the major UK retail banks. However, the political climate was shifting in favour of more competitive market practices, and the major UK retail banks found themselves accused of being an oligopoly and of cross-subsidisation. The proposed merger was refused and the challenge from the British Government to the perceived oligopoly began.

Most office work was still manual at this point. The heart of most bank’s systems landscape in the 1960’s became the large mainframe computer which tended to be oriented toward transaction processing applications (Steiner and Teixeira 1990). The major innovation of the 1960’s was batch processing (Svigals 1997). Banks first used programmable computers to batch process checks in the 1960’s, for example NCR’s Postronics machines. Increasing cheque usage led to the development of a centralised electronic fund transfer system, the Bankers Automated Clearing Services (BACS). There was also an increasing trend to computerize ‘back room’ functions of branches. This focused on the centralization of consumer credit and debit account records.

2.2.3 The 1970’s

In the 1970’s, the major clearing banks had to respond to the Monopoly Commission’s assertion that they were cross-subsidising. An extensive process of costing took place to break down the charges levied by the Big Four. This was part of a movement to bring an end to the ‘cartel style’ arrangements between the major retail clearing banks. It was felt that such collaboration was not in the best interests of the country and that more competition should exist between the retail banks.

In 1955, the Big Four retail clearing banks had 85% of sterling deposit liabilities; by 1975, they had lost this dominant position and only held 45% (Smith and Wield 1987). This was, ironically, partly the result of the retail bank’s advice to their customers to invest large deposits with building societies who paid a higher rate of interest on savings. The retail banks had traditionally concentrated on offering transaction processing and credit loans and only offered a low interest rate on deposit accounts. Meanwhile, permanent building societies had grown in popularity as a steady demand for home ownership emerged in the post-World War II era. Bank managers were told to advise their customers of the best way to achieve their financial
goals, even if that meant taking deposits away from the bank and investing them in higher rate building society accounts. The logic was, that if bank managers did not give their customers this kind of impartial financial advice, customers would take their business to another retail bank who would.

In search of other markets, international operations began to play a more significant role in the activities of retail banks. As part of the deregulation process, the Heath government introduced the Competition and Cost Control Act of 1971. As a result, the bank's lending activities were less restricted by the Bank of England. The UK banks were finally able to expand their operations beyond their formally restricted focus on export, manufacturing, industry and agriculture.

In the 1970's some retail banks began experimenting with organizational change; for example, large area banks would concentrate on a broad range of products, leaving small satellite branches to offer a limited range of personal banking. This subsequently proved to be an over division of labour and too costly to maintain (Smith and Wield 1987). There was also a slow shift of head-quarters' operations, especially the computer centres, out of London to other regions.

Headline grabbing robberies and the high cost of security for the movement of cash put pressure on retail banks and corporations to pay wages directly into bank accounts, rather than by cash. This coincided with a general move among retail banks to expand the customer base. The 1970's, therefore, saw the introduction of 'cloth cap' banking and the beginning of a market push in the personal sector for the business from C1 and C2 economic groups. A new range of products were developed specifically for this market.

In the 1950's and 1960's, the local branch managers made a point knowing as many of their customers as possible, augmented by a network of men's clubs, for example: Masons or Rotary; community involvement in local councils or governorships of local schools; or sports, especially golf. The increasing pace of growth meant that, instead of depending on these kind of personal relationships, local branch managers began to gather information via standard forms filled in by customers before the interview process.
Technological development in the 1970's focused on the growth of centrally administered credit card use, the introduction of Automatic Teller Machines (ATM) and the implementation of SWIFT international interbank electronic funds transfer. The emphasis was on improved data processing systems, particularly the on-line links between branch 'backoffice' and mainframe computers. Huge databases arose from the operation of transaction-type accounts. Later, systems developers would come to see these as 'data morgues', where potentially useful market data lay incarcerated and useless.

There were improvements in the processing of paper cheques. The introduction of magnetic ink in encoding systems was an important step in improving cheque throughput, as was the rapid increase in BACS turnover. Several processing innovations were also introduced, including non-return of cheques to personal customers and some counter automation.

2.2.4 The 1980's

This was the most dramatic period of recent history for UK banks with landmark legislation passed in 1986. The most significant changes were brought about by legislation but, as we will go on to discuss, there were also major changes in employment patterns and relations as a result of growing competition. The Building Societies Act and The Financial Services Act, led to the deregulation of the UK banking industry. The release of exchange controls between countries under the Thatcher government also had a significant impact on banking, considerably reducing the bureaucracy involved in international transactions. Other areas of financial services were also experiencing major changes, for example the October 1986 “Big Bang” stock market liberalisation and computerisation of certain stock trading functions.

As a result of de-regulation, the 1980's were a period of rapid change for the UK banking sector. Traditional lines of demarcation within the sector were broken down and competition widened to a broader product range (Thwaites 1991; Thwaites and Vere 1995).
This period saw substantial forms of re-structuring, including the closing of ‘Big Four’ branches in depressed regions, and down-grading of branches to a narrower range of services. The reduced staff needed to run the down-graded branches avoided the expensive pay packages afforded to larger branches. Branch work was still predominantly organized along scientific management lines (Hornby and Clegg 1992). In a survey conducted in 1989, many staff in British banks described their jobs as ‘routine and repetitive’ (Hornby and Clegg 1992).

The re-organization within the domestic branch network and a search for secondary markets expanded the job description of branch staff to include marketing new products, and put increasing pressure on their working day. The major clearing banks attempted to supplement income from savings and loans by selling new products like insurance, mortgage services, stock broking and other investment banking services.

During the 1980’s there was considerable debate about the impact of technology on employment. Nobel Prize winner Wassily Leontief and his colleague Faye Duchin fuelled debate in the United States by predicting that information technologies would displace 11 million American workers by 1990 and 20 million by the year 2000, a shrinkage of about 11% of the labour force (Leontief and Duchin 1986; Attewell 1996). Some argued that a shift was occurring from manufacturing and industry to services heralding the arrival of a new ‘information economy’ (Bell 1974). Therefore, although mass unemployment was anticipated in certain industries, it was predicted by many, for example Rajan (1984), that the services sector would significantly increase its number of jobs in the British economy.

Technological changes had an increasing effect on banking operations and major qualitative employment changes were underway (Smith and Wield 1987). However, the predicted shift in employment did not emerge. Although there was a concerted push to increase market size by each of the major retail banks and expand their product line, competition forced them to also contain costs. After the relatively large increases in the late 1950’s and 1960’s, recruitment by UK retail banks slowed during the 1970’s, and almost came to a standstill in the 1980’s (see table 2.1).
British banks tended to use former employees working intermittently rather than new or temporary employees (Hornby and Clegg 1992). This was presented on a ‘return to work’ basis, pre-dominantly for women who had left to have children (Hornby and Clegg 1992). According to Hornby and Clegg (1992), in 1988 part-time workers represented 14 per cent of all employees. Smith & Weild (1987) maintain that, if you take account of part-time workers (counted as 4/7th on the assumption that they work 20hrs a week), you have a slight decrease in overall employment in the clearers (table 2.1).

(Annual compound growth rate %)

<table>
<thead>
<tr>
<th>Year</th>
<th>All employees</th>
<th>Counting part-timers as 4/7</th>
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<tr>
<td>1950-1955</td>
<td>1.2</td>
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</tr>
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<td>1955-1960</td>
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<td>1960-1965</td>
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<td>1970-1975</td>
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<td>1975-1980</td>
<td>2.7</td>
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<tr>
<td>1980-1984</td>
<td>0.2</td>
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Table 2.1 Increases in clearing banks employment (England)

During 1986 and 1987, national collective bargaining over terms and conditions collapsed in the wake of the disbandment of the Scottish and English banking employers’ federations. Cressey & Scott (1991) maintain that the collapse of labour representation significantly weakened the position of bank employees in the relationship with their employers. It was suggested by managers interviewed in the Lending Advisor case study that the subsequent introduction of compulsory redundancies in the late 1980’s changed the nature of that relationship permanently.
Whilst employment levels in the banking sector were depressed, Britain's economy boomed in the 1980's. It was seen as a period that held considerable potential for market growth by the UK retail banks, who engaged in fierce competition on retail financial services, especially consumer credit and credit card facilities. UK market penetration was not as extensive as other countries, for example France. In France the personal accounts market is completely saturated, whereas in Britain in the 1980's there remained a significant number of adults without a bank account. For example, in 1981, 90 per cent of adults in France had a bank account compared to 60 per cent in Britain (Hornby and Clegg 1992).

There was considerable pressure on managers to 'go for growth' in both the personal and the corporate markets. Ezzamel, Willmott and Lilley, (1994) note that, in order to take advantage of, and cope with, this period of rapid expansion, concepts of flexibility were invoked by organizations which enabled a 'break with the rule book' and relaxation of controls. Dramatic growth followed, and the financial assets of the personal sector of in the UK increased more than four-fold, and liabilities (such as loans and customer credit) grew five-fold throughout the 1980's (Ennew, Watkins et al. 1990; Egan and Shipley 1995).

There was also a sharp increase in competition between British and foreign banks who focused on lending to UK companies with good profitability (Harris and Coakley 1987). The competitive environment led to serious attempts to cut costs, including labour costs.

Smith & Weild (1987) suggest that during this period five main areas emerged as the focus of competition. Firstly, in terms of higher interest rates to savers, the banks had substantial competition from building societies who increased their share of new savings from 46% to 57% in 1980-1981 whilst the bank's proportion plummeted from 45% to 22% (Smith & Weild 1987). Secondly, in order to compete with new products from other banks the Big Four had to endure lower margins between borrowing and lending rates. For example, marketing products that enabled customers to earn interest on the balance in their chequing accounts or provided free chequing. More flexible money transmission services, like credit cards and enhanced
ATMs, were also introduced and there was fierce competition among the different brands and networks.

Also of concern was the entry of the retailing sector into financial services which increased flexibility and ease of credit for mortgages, retail credit and small personal loans. For example, store cards were developed by companies such as Debenhams and Marks & Spencer, following in the footsteps of Sears Roebuck & Co in the United States, which circumvented the Big Four, offering easy access to personal financial credit. These new sources of credit had been enabled by the development of electronic funds transfer systems at the point of sales (EFTPOS) which now challenged the clearer’s oligopoly on money transmission systems.

The possibility of EFTPOS had the critical effect of removing the barrier of a branch network, as an entry requirement for retailing companies. Such innovations provided little ‘return’ relative to the cost of implementing them. This led to banks making cuts in their branch network, and downgrading hundreds of branches in attempts to cut costs, especially the costs of managers (Smith and Wield 1987).

‘The development of the banking sector’s electronic infrastructure in the 1980’s would prove to be a major influence on the transformation of UK banking in the 1990’s. ‘The history of banking has been that customers come to them, not vice versa. This is a tradition which must now be seriously threatened as companies such as Marks and Spencer (M&S) entered the market. With a fiercely loyal customer base and a universal reputation for excellence in customer service, M&S have a potential competitive edge based on both differentiation and - with new technologies - cost leadership’ (Egan and Shipley 1995).

There was considerable technological innovation in the 1980’s but this effort was focused on sector-wide transmission networks which established standards for transmission and exchange of funds. This concentration on the development of integrated systems meant that the anticipated displacement of jobs due to technology and revolution in the industry was not apparent during this period. The development of this infrastructure consumed resources and heightened the competitive
environment, as it opened up the banking market, putting more pressure on banks to rationalise.

The most important effects of new technology in the banking sector during the 1980's were the major political and strategic issues that it raised; who co-operates or competes with whom? Who should fund the technical developments? Who has control and power in the new environment? (Smith and Wield 1987).

2.2.5 The 1990's

The UK Banking sector is currently experiencing a period of 'extensive transformations' (Cressey & Scott 1991) due to competition in the market place following de-regulation in the 1980's and internationalisation. The main issues and concerns raised by researchers in this current period are: national competition, especially from new entrants into the banking sector; marketing; product diversification; new integrated and interactive branch transactions; and compliance with new international risk management standards. This sub-section will consider each of these issues in turn.

Ezzamel, Willmott and Lilley, (1994) maintain that 'within a context of increased uncertainty, the intensification of national competition is seen to be the key issue facing top management in the financial services sector'. The development of the electronic infrastructure in the banking sector, and continuous commitment to a free-market economy by successive UK Conservative governments, have helped to generate the current conditions of 'hypercompetition' (Zuboff 1996). The traditional alliance between gentlemen financiers in The City and the Conservative Party had not saved the major clearers or protected their oligopoly from someone essentially beyond their old boys network: Margaret Thatcher and her free market political programme.

This competitive environment has contributed an additional degree of perceived uncertainty into financial service organizations; many managers believe that profitable trading is becoming 'increasingly difficult' (Ezzamel, Willmott and Lilley 1994). Concern over profit figures and losses sustained during the early 1990s appear to have been regarded as enough cause for the radical re-organizations that are taking
place within most of the major clearing banks. ‘The downturn of the late eighties and early nineties provided both an incentive and a justification for a re-assessment of activities’ (Ezzamel, Willmott and Lilley, 1994).

In recent years, there has been an increase in the number and quality of new entrants into the UK financial services sector (Egan and Shipley 1995). At the moment they just provide savings and chequing accounts, but they plan to expand and provide a range of products in direct competition with the existing retail banks. Most notable among these new entrants are the supermarkets Sainsbury and Tesco who launched a limited, but highly competitive, range of personal banking products in 1996 and 1997.

Emphasis on cost containment, driven by competition in the market, has led to further rationalisation. Local branches are being organized into ‘clusters’, managed by ‘corporate’ managers, rather than local branch managers. Many of the remaining ‘backroom functions’ are being centralised in more cost efficient clerical ‘factories’. Service contracts, for example stationery, are being renegotiated and out-sourced if necessary. Managers within the major clearing banks are witnessing a period of compulsory redundancies and early retirement. The anticipated growth in employment in the services industry did not materialise; far from it, the job for life standard is gone, and many employees now feel insecure about their career interests, not just within their own bank but across the sector.

Compulsory redundancies in the late 1980’s had ravaged a traditionally placid dynamic between the banks and their employees. Growing discontent about the emerging terms of employment was voiced through limited industrial action. In September 1991, there was a national day of action by BIFU and the Staff Association of Lloyds Bank against new staff structures. But trades unions were not a powerful force in banking, and during 1992-1996, staff seemed to accept that many of the changes were of a regrettable-but-necessary nature in light of the intense competition in the industry.

‘At the end of the 1980’s the labour market for white-collar jobs was relatively tight in the South of England because of the boom in financial services and the predicted decline in the number of school leavers entering the labour market...’ (Hornby and
Clegg 1992). This has since changed due to falling profits and pressure to reduce jobs; now employees feel that the job market has worsened still further (Ezzamel, Willmott and Lilley, 1994). Managers might object to the transformations they are witnessing, but most feel there is nowhere to move, even if they wanted to.

One of the ‘extensive transformations’ that Cressey and Scott (1991) predicted in 1991, was that the major UK clearing banks would experience a ‘shift in organizational culture’ out of which a ‘new breed of bank staff’ would emerge. These staff would not feel the local ties that bound their predecessor and would be assessed by performance related criteria. Layers of hierarchy would be stripped away and staff would become more ‘customer facing’, supported by computer-based information technologies.

The primacy of customer sovereignty has been forced ‘onto the agendas of executives within a sector not particularly noted for having an external, market-driven outlook on business practice’ (Egan and Shipley 1995). The traditional belief that customers would make the first approach to banks has had to be replaced by a more customer-focused outlook across all financial services. Marketing has grown in importance at both a strategic and tactical level with greater attention given to identifying customer needs through market research. Considerable attention has been given to the notion of customer segmentation, with many organizations attempting to profile individual customer’s needs through electronic media for example database applications and the internet (Moules 1997).

Market branding and co-branding of products has been considered by the 'Big Four', for example the recent National Westminster and Tesco alliance. Some commentators have voiced concern that if major retail banks enter into such alliances they may be allowing ‘Trojan Horses’ into the sector. According to research done by Kleinwort Benson, the supermarkets may dump their banking partners if their schemes become successful, choosing to operate the services themselves. All of the major UK retail banks are emphasising their reputation and service quality as a way of distinguishing themselves from new entrants (Egan and Shipley 1995; Thwaites 1991).
The proliferation of products and fragmentation of market (Orton 1994) has revealed a growing potential for niche marketing, and there is evidence that some of the major clearers are developing products tailored to individual needs (Ennew, Watkins et al. 1990). There are also further changes in the nature of demand for products as a result of demographic shifts such as the ageing population; increases in home and share ownership; increasing financial literacy and awareness; increasing self-employment; and changes in the traditional structure of households with more women taking waged labour. This is an area where computer-based information and communications technologies have enabled significant innovation, for example new products, like internet banking and smart cards (Moules 1997) or variable rate consumer loans, calculated by algorithms (Orton 1994). Steiner and Texeira (1990) note that Bank of America’s retail deposit division introduced five new products between 1977 and 1982. In the period 1982 to 1990, it was able to introduce eighteen new products.

A further set of issues that are dominating 1990s banking are new integrated and interactive branch transactions. There have been radical changes in the delivery of banking services, for example kiosk banking, internet banking, direct electronic data interchange with customers and Inter-Bank Data Interchange (IBDE) (Chetham 1995). Telephone banking has been one of the most important revolutions in personal banking, although it has not had a profound impact on corporate banking which is the focus of this study. However, the range of services available via information and communications technologies in the retail banking market is expected to increase (Chetham 1995). More and more people no longer feel the need to deal face-to-face with an insurance broker or a bank teller and are happy to deal with their money matters over the telephone (The Daily Telegraph, Wednesday, June 8th 1994).

Finally, an additional tension in the current climate has accompanied the introduction of both domestic and international guidelines for risk management issues, for example the Basle Committee on Banking Supervision in July 1994 (Ullmer 1994). Financial institutions now need written policies and procedures that outlines their risk management, for example how they measure and control market and credit risk. Banks are becoming more conscious of preserving capital resources and monitoring risk exposure (Blanden 1997).
2.2.6 Technological developments in the 1990s

Table 2.2 provides an overview of the technological developments in the period under review here and highlights an important shift taking place in the use of computer-based information systems in UK banking. We can see that in the 1960's, when computers were first introduced into UK banking, they were used to automate core record-keeping, and technological innovation focused on 'back office' transaction processing. This stage of automation was investment intensive, and the high degree of co-operation between the major clearers in funding, designing and operating these systems led to a process of 'competitive standardisation', whereby none of the participants achieved a significant degree of competitive advantage. These innovations were also not particularly visible to customers.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>Batched transactions – core record keeping is automated</td>
</tr>
<tr>
<td>1970s</td>
<td>Branch teller and self-service online transactions – continued backoffice and beginning of front office automation. On-line terminals (ATMs) improve customer service</td>
</tr>
<tr>
<td>1980s</td>
<td>Sector-wide networks established standards for transmission and exchange of funds and enabled electronic funds transfer systems at the point of sale (EFTPOS) and growing use of credit cards</td>
</tr>
<tr>
<td>1990</td>
<td>Introduction of decision support systems to control and monitor credit risk. Emergence of network use to enable a new dynamic of 'customer-bank' for example EDI. Also introduction of internet banking, kiosk banking, electronic cash and smart credit cards. Product proliferation. Integration issues lead to modification of some backroom systems.</td>
</tr>
</tbody>
</table>

Table 2.2 The major IT developments in UK Banking 1960-1990

During this period bank branch transactions were 'batch' accumulated on tape reels for 24 hours, sequenced and used to update the database and customer records overnight (Svigals 1997). Updated records were only available in a standard printed format and, even then, not until the next day. This method was neither sufficiently flexibility nor timely. In the 1970's, therefore, UK banks focused on these backoffice automation issues and with the use of large random access memories achieved faster transaction processing and several front office innovations like ATMs. On-line
terminals were also developed for use by bank tellers in order to improve customer service and provide immediate inquiry and database changes.

The 1980s saw a further increase in systems sophistication, but were dominated by issues concerning the increased competition in the wake of deregulation. The computer-based information systems innovations in the 1970’s and 1980’s focused on developing an electronic infrastructure within the banking sector, and led to a fundamental operational transformation. However, the extensive co-operation needed between the major clearing banks to fund, design, develop and implement it led to competitive standardisation rather than competitive advantage (Howcroft and Lavis 1987). Technological changes appear to have had an increasing effect on banking operations, but at markedly different scales and time frames (Smith and Wield 1987) to those anticipated. For these reasons, by the end of the 1980’s, they did not lead to the predicted net redundancies, although major qualitative employment changes did take place.

Steiner & Teixeira (1990), predicted that during the 1990's the banking sector would enter a further stage of technological innovation, which would focus inwards and enable competitive advantage between retail banks. In the period between the late 1950’s and the end of the 1980’s, computer-based information systems expenditure was increasing rapidly and yet banks were not seeing competitive advantage emerging. Steiner & Teixeira (1990) suggested that, as mentioned above: ‘This is because they are investing approximately 95% of all the systems expenses going into funds movement in standardised, routine, relatively mechanical systems. In most of the other functions, we believe, routine expenses similarly make up the lion’s share (more than 80%) of all systems expenses’. Further, the branch transaction processing concepts that emerged during the previous three decades have since been adopted worldwide by the banking industry (Svigals 1997).

Concentration on developing an electronic infrastructure had the effect of opening up the market to competitors (Orton 1994) since it circumvented the need for a national network of branches, and was a major influence that led up to the current conditions of intense competition. Powerful entry barriers such as extensive branch networks were eroded by the convergence of computer and telecommunications technologies.
(Orton 1994), a breakthrough which has given suppliers the opportunity to deal directly with a large and widely dispersed customer base (Egan and Shipley 1995). At the same time the attempts by banks to diversify into secondary markets within traditional product lines, for example pensions and insurance, did not provide the income or competitive advantage that banks had hoped.

Until now, the paper-to-electronics transformative process has affected how banking gets its work done. In the future, information technology, as an “enabling force,” will affect what the industry does. Although these innovations are still under development, the evidence from the LA case suggests that Steiner and Teixeira’s (1990) prediction was appropriate: ‘New electronic transactions and products are the world of the future for the banking industry’ (Steiner and Teixeira 1990). The aim is to increase quality of service, but decrease costs by tailoring services to specific needs in a new environment of one-stop banking (Chetham 1995).

The shift in technological innovation from transaction processing to transforming business processes within banks has the potential to create significant economic change (Orton 1994) and may lead to elimination of many employees. Indeed, 50,000 jobs were lost in UK banking in the period 1990 to 1995 (Chetham 1995).

The areas where Steiner and Teixeira (1990) claim most potential lie are credit, marketing and distribution. The focus in credit will be the development of more effective ways of avoiding loss. In marketing there is seen to be considerable potential for retail product innovation, like smart credit cards and internet banking (Moules, 1997), and wholesale customer control.

Information and communications offer new way of interfacing with the customer and delivering services which will lead to the service dynamic becoming 'Customer-Bank'. The customer will have their transactions dealt with at the first point of contact, instead of being transferred from bank representative to bank representative. Product proliferation is expected to gain momentum in the market and there will be a growing overall dependence on computer-based information systems (Steiner and Teixeira 1990). Backoffice systems may have to be modified in order to support these changes and issues of integration within the information systems architecture will emerge.
Steiner and Teixeira (1990) suggested that considerable potential for computer-based technological innovations in the 1990's include expert systems, such as Lending Advisor studied in this thesis, and new delivery systems like the internet (Knights and Tinker 1997; Moules 1977) and other telecommunications.

A noteworthy aspect of the literature concerned with information technology in banking is the tendency among those authors towards technological determinism. For example, Rajan (1984) maintains that information technology 'has had and will continue to have, a radical impact on the provision of services, skill requirements and work organization of banks'. Smith & Weild (1987) suggest that technology was the most important influence on the rising productivity within UK retail banks during the 1980's. A Technology in Finance Survey in The Economist made its central proposition 'that, thanks to technology, financial services are on the cusp of dramatic change' (The Economist, 1996).

This thesis takes a different approach, firstly it maintains that both increasing competition and computer-based technologies were major influences on the transformation of the UK banking sector. Secondly, it emphasises that whilst computer-based technologies enable certain kinds of responses to this competitive environment, the outcome of those innovations were determined by human agency and intent.

The major clearing bank in the Lending Advisor case study was the first to attempt to introduce an expert system into corporate middle market lending process in the UK banking sector. Lending Advisor represented a leading edge technology within UK retail banking. The other major retail banks have since developed similar computer-based DSS for their UK credit risk management divisions. It is suggested that Lending Advisor, therefore, marks the beginning of a movement within UK Banking to accept the quantitative methods of risk assessment as a new industry norm (Baliman 1996; Blanden 1997; Cates 1996).

It is important that studies like this dissertation attempt to understand the consequences of introducing these kinds of highly rational, computer-mediated interpretations of risk into key work processes in UK corporate credit risk
management. This is particularly so, since many authors in the mainstream banking literature have announced that the introduction of information systems, like Lending Advisor, means that credit risk has now been ‘dealt with’ (Davidson 1997, 1997a; also Beckstrom 1997; Glassman 1997). The UK banking literature has moved on to consider how to manage other kinds of risk (Glassman 1997) and on to issues such as new forms of service delivery, for example internet banking (Moules 1997), and competition with non-banks (Orton 1994; Svigals 1997).

The hypothesis presented here is that the implications of some assumptions and practices associated with computer-mediated interpretations of risk may have been overlooked. Precisely because LA, and technologies like it, are leading edge the consequences of introducing them need careful scrutiny. The idealised models of risk embedded within them do not necessarily take into consideration externalities, local conditions or the possibility of inter-relatedness of different kinds of risk. This dissertation, therefore, aims to push issues relating to the computer-mediated interpretation of risk back into the public arena where the consequences for local, national and international stakeholders can be debated.

The next section of the literature review will explore the nature of computer-based decision support systems, like Lending Advisor, and their role in risk management.
2.3 The concept of risk

The Lending Advisor research project initially set out to explore the consequences of introducing a computer-based decision support system into key work processes involving a financial model of risk. However, it was found that a review of the concept of risk in different discourses highlighted important political, social and economic issues that informed the analysis of risk in the dissertation. Risk, therefore, moved from being one of a number of key themes, to a central explanatory concept in the thesis. The vehicle for this transformation was primarily the work of Ulrich Beck (1992, 1994, 1995) in Chapter Seven. This sub-section provides the reader with the background material to understand the transition in the status of risk in the thesis.

This sub-section begins with an introductory overview and then proceeds to trace the history of the term 'risk'. The emergence of rational, quantitative models of financial risk is described and a traditional method of risk assessment in UK banking is outlined, using the example of UK Bank. In the next part of the sub-section it is suggested that media and market awareness of world events has contributed to an increasing perception of risk which, in turn, has led to a demand for formal methods of risk management. The academic theories that underpin current risk management tools are reviewed and the enabling role of computer-based information systems is considered.

In the next part of the sub-section, it is suggested that dependence upon rational forms of risk assessment may introduce new risks into the ecology of the financial world. It is proposed that the organizational changes that accompanied the introduction of the Lending Advisor decision support system introduced new risks into the lives of the managers that had to use it. In order to better understand these further risks, it is proposed that the review of 'risk' be extended to other discourses. It was felt that vivid empirical examples used by these authors convincingly communicate dimensions of risk that are scoped out of the rational, financial discourse.

Alternative ways of conceptualising risks in other discourses raise issues and themes which are also important for the development of this thesis. They help us to understand the changes in UK Bank within the context of broader transformations in
the concept of risk in modernity. The themes and issues raised concerning the concept of risk in these discourses help us construct the thesis and provide a conceptual foundation for the later analysis of the concept of risk.

Particular attention is given to the way in which the concept of risk has been considered at an abstract level by certain social theorists who have developed a thesis relating to the social construction of risk and identity in society. It is suggested that this provides an interesting theoretical context in which to analyse the Lending Advisor case study, one which has not been widely used by other IS researchers and therefore offers unique insights.

2.3.1 A historical perspective: gambling, navigating and market deals

In many ways this entire dissertation is concerned with the definition and re-definition of the concept of risk, and with the definition and re-definition of ourselves in response to our changing perception of risk in our lives. It is concerned with the emergence of competing concepts of risk in our globalising world; a major theme in the case study is the potential problems associated with introducing new kinds of risk into our financial and social systems.

If our thesis rests upon the assumption that the definition of risk in the world is changing, this presents us with a challenge: what definition should we begin with? Since part of our analysis of risk considers its role in the shift from one kind of society, a traditional industrial society, to another, the 'risk society' (Beck 1992) it seems appropriate to begin with a historical perspective.

Historically, there appears to be have been three different senses in which the concept of risk was understood. In early human civilisations, the concept of risk was predominantly associated with games and gambling (Bolen 1976; Cohen 1956; David 1962; Eadington 1976; Oldman 1974; Wade 1973). Games that were to form the basis of modern gambling, like poker and craps, were brought to the west during the crusades, for example astragalus or knuckle-bone and al zhar (hazard). At this point there was no structured theory of risk and risk-taking was embedded in the mystery of
‘Lady Luck’ and intuition. The future was the domain of Gods, soothsayers and fate, entities that the ordinary human could not control.

Almost a millennia later, early European sea explorers used the notion of risk to describe the process of going into ‘the unknown’, beyond the area that had been mapped by others. These early sea explorers would try to plan their journeys based on their assessment of the data that was available to them, then focus their projects on the hope that the result would be intrepid, but not suicidal. Many myths and stories existed to fuel their sense of uncertainty and dread. Early cartography used illustrations of monsters and dragons to indicate dangerous, unknown territory.

It is this sense of daring that lies at the root of the word ‘risk’. The English word ‘risk’ derives from the early Italian ‘risicare’ which means ‘to dare’. This came into frequent parlance in the fifteenth century Italian city states where the merchants used it to refer specifically to market exchanges. Therefore one of the roots of this word is the desituated language of means-ends rationality (Lash et al, 1996). The origins of this predominantly economic sense of ‘risk’, lie in the Hindu-Arabic numbering system which was brought to the west seven to eight hundred years ago. The emergence of the concept of market risk marks the beginning of the evolution of modern risk theories. Since this concept of risk is so crucial to our thesis we will shift our emphasis away from perceptions of risk in games, or the risk associated with adventure, in order to consider in more detail the context in which the financial model of risk emerged.

2.3.2 The financial model of risk
The quantitative concept of financial market risk did not develop further until after the Renaissance when it became the focus of a study by the mathematicians Blaise Pascal and Pierre Fermat. However, even then it was a discussion about a gambling game, rather than financial markets, that prompted Pascal to work with Fermat in 1654. ‘The question was how to divide the stakes of an unfinished game of chance between the two players when one of them is ahead. The puzzle had confounded mathematicians since it was posed some two hundred years earlier by the monk Luca Paccioli’ (Bernstein 1996). Together, Pascal and Fermat solved the problem and, in
so doing, founded the theory of probability which lies at the mathematical heart of the concept of risk.

Scholarly efforts during the Renaissance put human achievements and accomplishments on a pedestal, and generated a programme that was to become known as the project of ‘Enlightenment’. This was the notion that humans could harness nature for their own means and, through pursuit of the arts and rational scientific study, become closer to God. This was the era of radical social innovation, of Martin Luther who challenged the status of priests as the intermediaries to God, the age of the printing press and the translation of the Bible into the vernacular. It was in this turbulent social context that the notion of fate, luck and destiny came to be challenged by the theory of probability and the movement that would compel some human agents to attempt to control the future began.

Most of the major theoretical developments in the mathematical foundations of modern day financial risk theory occurred in the 18th century. For example, Jacob Bernoulli’s invention of the ‘law of large numbers’ and methods of statistical sampling in 1703; the development in 1730, of the structure of the normal distribution (the bell curve); and the concept of standard deviation by Abraham de Moivre. ‘Together these two concepts make up what is popularly known as the law of averages and are essential ingredients of modern techniques for quantifying risk (Bernstein 1996). These developments were made in the midst of growing scientism, as social institutions began to turn to natural sciences as a way of addressing society’s problems and as a way of legitimising action.

Daniel Bernoulli’s work, in 1738, defined the systematic process by which most people are supposed to make choices and reach decisions. He maintained that the satisfaction resulting from any small increase in wealth “will be inversely proportionate to the quantity of goods previously possessed” (Bernstein 1996). In 1754, Thomas Bayes’ advance in statistics demonstrated how to make better-informed decisions by mathematically blending new information into old information. Bayes’ theorem focuses on the frequent occasions when we have sound intuitive judgements about the probability of some event and want to understand how to alter those judgements as actual events unfold.
What were the consequences of these advances in the calculation of quantitative risk for western society? By 1725, mathematicians were competing with one another in devising tables of life expectancies, and the English government was financing itself through the sale of life annuities (Bernstein 1996). By the middle of the century, marine insurance had emerged as a flourishing, sophisticated business in London (Bernstein 1996). However, the major influence of the quantitative conceptualisation of risk was yet to come. It took almost 200 years, and the invention of the computer, for this way of assessing risk to be extensively adopted by financiers. The next subsection will consider how risk was traditionally managed in UK banks before the advent of these modern techniques and electronic media.

2.3.3 Traditional methods of risk management in the UK banking sector

A traditional, manual risk management processes will be described within the context of corporate loans at the UK Bank case study site. This sub-section draws upon extensive interviews, conducted by the researcher, with retired bank managers; historical material held in the archives of the Chartered Institute of Bankers; and a book written by two former UK Bank employees, Tuke and Gillman (1972). A consideration of these traditional methods raises important themes and issues that will be explored in the analysis of the case study.

One of the main ways in which corporate loan risk was managed in UK Bank was via a hierarchy of discretionary limits. A local branch manager would have an upper limit to which he could lend money to any credit-worthy individual or company. If the borrower required a sum above that figure, his request would be passed on to local directors at the local head office. Likewise, each local director had his own discretionary limit, and any request for a sum in excess of that would be discussed by the local board of directors which, again, had a maximum to which it could lend to any individual borrower. Requests for any sum in excess of the local boards discretionary limit would be considered by the advances committee, which was
selected from the senior local directors and held regular meetings in the head office in London.

Monitoring of advances was by way of a ‘control book’. This paper-based document showed the basic statistics (turnover, range, average balance) for the preceding twelve month period to the 31st December, the overdraft or loan limit, and details of any security held by the bank for each borrowing customer, together with details of his occupation or business. The balance at the close of business on the third Wednesday of each month was entered, and the document sent to the local head office for examination by the local directors, who would comment where appropriate and, in due course, return the document ready for completion the following month.

By the mid-1970’s, when all of the branch book-keeping was on computers, the control of advances return, as it was then known, was also produced by computer, with the exception of entering of the details of the security held by the bank which was still entered manually. However, automation of the return did lead to certain innovations with regard to management information, for example the monthly range of the accounts was also shown in addition to the actual balance. Indeed, over a period of time, various statistics covering the performance of the branch in the control of advances were also incorporated into the monthly return.

Apart from the ‘control book’, the local branch manager was required to report to the local directors in writing on any account where payment of cheques took the lending beyond his personal discretion or exceeded the approved limit. All branches were subject to regular, random inspections by internal UK Bank inspectors, appointed and controlled by the head office in London when, among other matters, all lendings would be reviewed. Copies of the inspection report would be sent to both the local head office and head office in London. Should more than 1% of lendings be considered ‘doubtful’ at the time of an inspection, the manager would be the subject of a special report. One of the local directors would visit each branch every three

*The masculine pronoun is used throughout this sub-section. There were no female bank managers or directors within UK Bank in the period under study here. The culture within the finance sector during this period reflected the dominant class and gender prejudices within the UK.*
months and, on this occasion, all lendings of any significance which were causing difficulty would be discussed with the local branch manager.

Finally, at the close of business on the third Wednesday in September, the branch was required to submit a return of all lending in excess of a figure set by the banks auditors. A supplement to this return was also required at 31st December to enable the auditors to comment on the bank's lending position.

This description of traditional risk management methods within UK Bank raises further issues and themes for our thesis. For example, there is considerable emphasis on situated local knowledge. Throughout this sub-section most of the actors have been referred to as local branch managers and local directors. The traditional methods of risk assessment were overseen by local directors who were often born and bred in the immediate geographical area and had extensive local knowledge. During this period branch managers were required to live in the local area and to become involved in the community with the aim of familiarising themselves with the local people and their business markets. Risk assessment and management processes were carried out annually. This was one of the reasons that the bank insisted that managers lived in the community. If anything started to go wrong with a local company to which UK Bank had made a corporate loan, the manager would hear about it and be in a position to act in a timely way.

Criteria for risk assessment only began to be formalised within UK Bank during the 1970's. Before then, risk assessment was partly a matter of local knowledge and partly instinctive. More formal and precise risk management methods could be found but these tended to be in highly specialised areas, not at the general branch level. Local knowledge was, therefore, highly valued by UK Bank at this time and an integral part of its risk assessment expertise.

The next sub-section will consider the series of social, economic and political changes which convinced the financial sector that these qualitative methods of assessing risk were no longer satisfactory ways of managing risk.
2.3.4 Risk in an uncertain age

As discussed in the previous section, in the last few decades historic changes have taken place and the UK banking sector has become exposed to an intensely competitive environment. A number of world events convinced the financial services sector that markets were becoming increasingly uncertain. For example, during the 1970’s, jumps in oil prices influenced volatility in the commodities markets. This led to simultaneous crashes in both the bond market and the stock market. In the USA, values fell more than 40% from what they had been two years earlier (Bernstein 1996).

The 1980’s were a time of radical change for the UK banking industry with deregulation in 1986; the release of exchange controls between countries under the Thatcher government; and the October 1986 “Big Bang” stock market liberalization and computerization. The relentless tremors continued in 1987 with Black Monday (October 19th) when the Dow-Jones industrial average dropped 508 points (Kindleberger 1996). The 1990’s continue to bring uncertainty and upheaval with the foreign-exchange attacks on sterling in 1992, and collapse of the European Monetary Union in 1992. Currently, Britain’s future in Europe and the single European currency dominates political debate.

The social theorist, Anthony Giddens (1991), characterises this stage of modernity as a ‘runaway world’ where the pace of change around us is bewildering and new risks seem to be invading our consciousness demanding a response: newly discovered health risks like AIDS; environmental disasters like Chernobyl; and increasing threats to personal safety not just in inner cities but in quiet Scottish villages like Dunblane. A worldwide network of media and telecommunications ensures that these consequences of events are no longer constrained by their location. The recent development of 24hr global money markets exhibits ripples of anxiety with every major crisis. This global interdependence has made risk management increasingly complex.

In Peter Bernstein’s recent book on financial theories of risk, Against The Gods (1996), he maintains that it was the simultaneous crashes in both the bond market and
the stock market in 1973-1974 that created a demand among stockholders for new risk management methods and products. 'Had it not been for the crisis of 1974, few financial practitioners would have paid attention to the ideas that had been stirring in the ivory towers for some twenty years. But when it turned out that improvised strategies to beat the market served only to jeopardize their clients' interests, practitioners realized that they had to change their ways. Reluctantly, they began to show interest in converting the abstract ideas of the academics into methods to control risk and to staunch the losses their clients were suffering. This was the motivating force of the revolution that shaped the new Wall Street' (Bernstein 1993).

The next sub-section will consider how mathematical theories which had been known in academic circles for almost 100 years formed the foundation of modern computer-based risk management systems.

2.3.5 Academic theories of risk and the evolution of risk management tools

Louis Bachelier (1900) was the first person to attempt to use mathematics rather than intuition in valuing risk on options. Bachelier's work lay unrecognised for a long time until in the 1950's, when it was re-discovered and triggered a major research effort by a group of economists including Paul Samuelson. This work was continued by researchers like Fischer Black, Myron Scholes and Robert C. Merton.

As Bernstein (1993) says: 'Another major player in the revolution was the computer itself. ... By transforming the sheer mechanics of financial transactions, the computer shaped their outcomes as well'. Advances in computer-based technology made the application of these theoretical principles possible just as a perceived need for them grew. By 1984 Security Pacific, Citibank, Chase, Chemical, American Express and other financial corporations had started projects using artificial intelligence techniques and tools. Most of the initial financial applications involved decision making systems, including commercial and individual loans and fraud pattern detection.

Advocates of these innovations, triggered by the revolution in finance, maintain that they help investors deal with uncertainty; they provide benchmarks, establish norms,
and reformulate familiar concepts like risk, return, diversification, insurance, and debt. They have quantified those concepts and suggested new ways of employing them and combining them for optimal results. ‘Finally, they have added a measure of science to the art of corporate finance’ (Bernstein 1993).

The basis of these risk management tools are economic and statistical theories whose aim is to bring risk under control by identifying patterns in financial data. Yet risk is, by its nature, unpredictable. The changes that are occurring around us today ‘may not have been unpredictable, but they were unthinkable’ (Bernstein 1996). Bernstein (1996) continues: ‘If these events were unpredictable, how can we expect the elaborate quantitative devices of risk management to predict them? How can we program into the computer concepts that we cannot program into ourselves, that are even beyond our imagination?’

This dissertation provides a longitudinal case study exploring the consequences of implementing a computer-based decision support system whose software is based upon these highly rational and idealised academic models of risk. The potential limitations of technologies based upon quantitative risk management and historical data are considered in the analysis of the Lending Advisor case study. The thesis explores the nature of these risk management technologies, like Lending Advisor, and raises issues for their management and use.

It is also suggested in the thesis that the organizational changes that accompanied the introduction of the Lending Advisor decision support system brought a new sense of insecurity into the lives of the managers that had to use it. The introduction of computer-based decision support systems embeds this rational perspective of decision-making in organizations and presents a particular interpretation of risk. This thesis considers the consequences of this upon the individuals using the system and the implications the management of this technology might have, since the users are bound up in a reflexive relationship with the broader environment in which they exist.
2.3.6 The concept of risk in different discourses

Our attention thus far has been on the emergence of a highly rational, pre-dominantly quantitative method of assessing and managing risks. It was essential that we did so, since this is the method embedded in the Lending Advisor decision support system which features in the case study. However, in the later analysis section of this thesis it is emphasised that the financial model of risk is not the only way in which risk has been conceptualised, nor is it the only concept of risk that is being transformed in our modernising world. The way that we understand and perceive risk in our everyday lives is also changing and therefore these quantitative theories of risk, whilst critical to our understanding of how we currently manage certain kinds of risk, are only part of the story.

This aim of this sub-section is to consider the concept of risk in other discourses in order to explore the broader context in which transformations in risk are occurring. The way in which the concept of risk is framed in these other discourses raises important themes and issues for the analysis of risk in this thesis and opens up the concept of risk for academic interrogation. This sub-section does not attempt to review every discourse in which the concept of risk is referred to. For example, one could also consider risk in the context of health (Redelmeier 1990, 1995); public safety; cognitive science (O'Riordan 1983); psychology (Finney 1978; Hogarth 1987; Lopes 1987; Tsukahara 1976; Tversky 1990); military; and insurance (Hodgson 1984; Knights 1993; Townsend 1995). From the many possible focuses for this discussion, this sub-section will focus on three major areas in which the concept of risk plays a major role: risk in the context of reproductive bio-technologies; risk in the environment debate; and the concept of risk in current social theory. These areas were chosen because they highlight certain key themes and issues that are relevant to the analysis of the concept of risk in this thesis. In particular, they highlight examples of 'new' risks and choices that are opening up in society. It is suggested that the way in which we respond to these risks and opportunities at a local level may shape the emerging global society.
2.3.7 Risk in the context of reproductive technologies

This sub-section will focus on the research of Elizabeth Beck-Gernsheim (1996) in the field of bio-technology and, in particular, the way in which it has enabled 'life as a planning project'. Beck-Gernsheim (1996) suggests that new risks emerged once women embarked on the process of planning their lives and constructing new identities beyond the constraints of traditional industrial society. Further, she maintains that in the current rhetoric associated with bio-technology and, in particular, the human genome project, we can see competition between different ways of conceptualising 'risk'. She suggests that the concept of risk is being re-defined and re-framed by a bio-reductionist discourse that dominates the field of bio-technology. Women are being asked to make individual ethical choices based upon persuasive scientific rhetoric which could have profound consequences for the way in which future societies emerge.

In her research, Beck-Gernsheim (1996) considers the changes in female roles in society since modern contraceptive technologies enabled women to plan pregnancies. Until modern contraception was invented, the role of women centred upon their capacity to reproduce and the majority of their resources were devoted to the inevitable process of child-birth and child-care. Their choices about this process were minimal, and expectations surrounding traditional social bonds and institutions usually bound them to their role. Birth control enables women to plan pregnancies, thereby delaying or avoiding these traditional roles, while they explore their individual identity and realise their potential to contribute to society in other capacities: artistically, intellectually, and commercially.

Although many women may choose and plan their lives from multiple futures which are now open to them, Beck-Gernsheim (1996) urges us to consider the power relations within the new landscape that lies before them and the new risks that they encounter. She suggests that despite the new control that women have over their lives, neither government nor corporations have made the task of managing career and life any easier. Indeed, she contends that: 'Having children is today the structural risk of a female wage-earning biography; indeed, it is a handicap, measured by the yardstick of a market society' (Beck-Gernsheim 1996).
Having a child, then, is to accept a measure of sacrifice in terms of one's career, and to risk being bound by traditional gender roles. This risk is exacerbated if women give birth to handicapped children who need constant care and attention. Recent advances in reproductive and human genetic technologies have given us the means to conduct tests on a foetus in the womb. This has enabled parents to choose whether or not they want to continue with a pregnancy if the tests reveal that there is a risk of the child having a genetic predisposition to conditions like, for example, Downs Syndrome. The increase in mature pregnancies enabled by reproductive technologies, coupled with the decrease in babies being born with conditions like Downs Syndrome is shaping a new family profile.

The biological reductionism (reducing complex, phenomenon to their elemental, rational, biological components in a way that decontextualises them from their social context) underlying much of the current rhetoric in bio-technology is encouraging women to extend the way that they plan and choose pregnancies. The human genome project is enabling further potential choices and ways of planning births. It has 'extended the criteria and definition of risk groups to encompass those considered to bear a specific genetic risk, an inherited disease or susceptibility to a disease' (Beck-Gernsheim 1996). There is even suggestion that we will be able to plan pregnancies according to the probability of the child inheriting other characteristics, for example, a propensity towards crime or obesity.

The example of reproductive technologies is a powerful one not only because it highlights certain new risks and ethical dilemmas introduced by these new scientific developments, but also because it is a prime example of a situation in which if a technology exists we feel obliged to use it. From a Foucauldian perspective modern freedoms subtly metamorphose into obligations. It is suggested that this notion holds considerable insight for understanding the use of computer-based technologies in the financial sector, as discussed in the above sub-section on 'risk in an uncertain age'.

Beck-Gernsheim's (1996) concern is that individuals are being saturated by rational, scientific discourse in which the concept of risk is highly technical and divorced from ethical considerations. It can lead to a societal discourse in which individuals can
side-step responsibility for both individual and collective actions. For example, it was recently suggested by Daniel Koshland, editor of *Science Magazine*, that it would be better to put money into the human genome project, than into housing since it was more important to fight the cause than the symptoms of social problems (Beck-Gernsheim 1996). He advocated searching for a technical solution to social problems.

Beck-Gernsheim suggests that social scientists ‘are used to thinking in terms of social risks and of those groups which are unable to keep up with the imperatives of the individualised achievement society (for example, the unemployed, single parents, the homeless)’. Her concern is that sociological studies are limiting their focus to these traditional categories and are not keeping up with new social risks of the kind highlighted by reproductive technology. Whilst technology can be emancipatory and present us with great opportunities, it can also introduce new risks to society.

Beck-Gernsheim’s research into bio-technology raises some important themes and issues for this thesis (see table 2.2). She asks us to contemplate the way in which the concept of risk is being defined and re-defined, particularly in western market society where it constantly implies winners and losers: risk to whom, how, when, where? This research reminds us that the concept of risk is different depending on where you are placed in certain power relations in western society, in this case involving science and gender; for as Marx says, ‘we make our own destiny, but not in circumstances of our own choosing’. It also highlights the way in which advances in technology provide us with the ability to identify specific risks that had previously been beyond our understanding and/or control.

Her research challenges us to consider how choices enabled by new technologies and informed by a rational, scientific discourse, in this case parents planning births, can help to shape our globalising world. Technologies that are being developed in scientific communities open up new ethical spaces and create new choices, yet our rational scientific discourse is enabling us to avoid responsibility for these broader implications for society. Furthermore, although the UK government does have a small number of groups who monitor developments in this area, some important decisions relating to the development and use of these technologies are nevertheless taking place beyond the traditional, protective institutions of industrial society:
government, political parties, trades unions. Finally, this research highlights a key theme for this thesis: that the introduction of technology into certain areas of our lives produces high-consequence risk, new kinds of risk, that will need further expertise to be developed if we are to address them.

<table>
<thead>
<tr>
<th>Issues and themes raised</th>
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<tr>
<td>Technology can be emancipatory, however it can also introduce new risks to society</td>
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<tr>
<td>Where we are placed in a web of power relations will influence how we interpret and act in response to perceived risks</td>
</tr>
<tr>
<td>Decisions about these technologies are taking place outside of the traditional, protective institutions of industrial society</td>
</tr>
<tr>
<td>Rational models of risk can be used to scope out ethical issues and responsibility</td>
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<tr>
<td>Individual responses to new risks may shape our globalising world</td>
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<tr>
<td>More current research needs to acknowledge and explore the consequences of these new risks</td>
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Table 2.3 Issues and themes raised by the bio-technology debate

2.3.8 Risk in the context of the environment debate

This part of the sub-section focuses on ‘risk’ in the context of the environment debate. It considers the shift in the logos of this debate from lay-actor protest groups to expert scientific discourse. It is suggested that this raises an important epistemological theme for this thesis concerning the neglect of lay knowledge. This is pursued using Brian Wynne’s case study of the interaction between Cumbrian sheep farmers and scientific agencies. Wynne considers rational processes of risk assessment and management from the perspective of the sociology of science.

Although concerns about the environment have been raised by lay-actors and sub-culture groups since the nineteenth century (and possibly earlier), they finally met with considerable media attention in the 1960’s. The focus of these early protests tended to be the use of pesticides, especially DDT, and their impact on local ecological systems. In the 1970’s the debate gathered momentum and its focus moved onto other issues, for example acid rain and nuclear power. By the 1980’s, the issues had become more global in nature as their impact became increasingly disembedded from time and space, for example: depletion of the ozone layer and the
effects of global warming. New social norms began to be practised in many western societies as individuals recycled their waste materials and expected others to do the same or be subject to disapproval and social disciplining. Corporations began to acknowledge ‘green issues’ and a new ‘green speak’ of sustainability emerged, supported by scientific reports, surveys and investigations, which aimed to balance impact on the environment with economic growth (for example the rise of The Body Shop).

In order to participate in formal discourse with governments and corporations some environmentalists became ‘professionalised counter-experts’ (Beck 1992). This ‘coming in from the cold’ is consider by some to mark the end of radical action by many environmental movements (Hajer 1996). A significant proportion of the environment debate fell into the realm of scientific discourse and expertise, imbued with the language of prediction and control. Some environmental groups joined with commerce and government in attempting to find technical solutions to environmental problems. The media reported on the technical schemes generated by the scientific community, some of which bordered on the fantastic; for example, that depletion of the ozone layer should be addressed by firing rockets filled with ‘antidote’ gases and chemicals into the atmosphere; or even that we should begin colonising another planet. All of which would, of course, necessitate the development of further advanced technology and put the future of our planet and ourselves in the hands of technological experts. Lash (1996) describes this as:

’[E]cological modernisation...where technical solutions are found for even the most potentially apocalyptic of natural issues, and where, crucially, the instrumental social sciences are harnessed as a key resource for ‘optimising’ societal responses to the environmental costs and benefits in an intensifying commodification of nature – ironically in the name of its own protection.’

This re-definition of environmental risk and its solutions in terms of the technical, highlights important epistemological issues which are relevant for this thesis. Firstly, the shift in this discourse from the practical lay knowledge of the sub-culture environmental action groups to rational, scientific, expert knowledge highlights an
increasing neglect of the epistemic value of lay knowledge (Wynne 1996). It also points to attempts to achieve effective, practical policy intervention.

It is suggested that the current confusion in the environmental debate can be partly understood in terms of the politics of knowledge. Wynne (1996) maintains that the reason why it has become so difficult to distinguish genuine contributions to our understanding of our ecology from the ‘noise’ that dominates the media is that so few actors in the current debate have embraced the sociology of knowledge. Much of the contemporary debate is restricted to, and by, the epistemological parameters of rational, western science. Brian Wynne’s (1996) research on the interpretation of environmental risks, and in particular his study of the struggle between scientists from various agencies and sheep farmers in the north of England, hold considerable insight for this thesis and therefore will be considered in some detail here.

In the wake of the 1986 Chernobyl nuclear accident, farmers in the Cumbrian region of England were subject to restrictions on sheep movements and sales due to radioactive contamination from fallout. The ban was initially for three weeks, but was suddenly extended indefinitely. The implications of this for the economically fragile community of farmers were potentially disastrous. Wynne (1996) notes how ‘completely controlled’ the farmers felt during this process. The experts failed to recognise the social reality facing the farmers: the problems of over-population; over-grazing and possible starvation; the costs incurred from importing feed; build-up of disease and other problems.

Eventually it became apparent that the initial findings and predictions has been based upon experiments that had been conducted on clay soil from a different region of the UK, which absorbed and chemically ‘locked up’ the radioactivity. The acid peaty soil in Cumbria behaved differently, allowing the radioactivity to remain chemically mobile, ‘hence available for root uptake form the soil, back into the vegetation which the sheep grazed (Wynne 1996). The experts had assumed that knowledge drawn from particular conditions was universal knowledge with devastating implications for the Cumbrian farmers. Public controversy followed as the expert agencies avoided admitting a mistake and were accused of deliberate misinformation.
Of all the areas being tested, a small crescent-shaped hill area near the coast, downwind from Sellafield nuclear plant, persistently registered high levels of contamination. Sellafield experienced the world's worst civil nuclear accident in 1957 after which the farmers were banned from selling milk for some weeks. Yet the scientists in 1986 declared, again without any trace of uncertainty, that based on the emission 'signature' the current levels of contamination were due to Chernobyl, not Sellafield. The farmers were not persuaded, yet lacking the know-how to generate their own expert knowledge their mistrust could not translate into action and realising their dependency upon the experts often spoke and acted as if they trusted them (Wynne 1996):

'A typical farmer's assessment was: "The scientists tell us it's all from Chernobyl. You just have to believe them - if a doctor gave you a jab up the backside for a cold, you wouldn't argue with him, would you?"

The experts persistently denied the specifics of the local situation and acted according to universal rational assumptions which denied local knowledge. For example, the experts ignored the farmers comments about the nature of the local soil used for testing and held the misguided belief that straw would make up for the drastic shortage of grazing. The clash of cultures seen in this example reveals two very different sets of assumptions about agency and control. As Wynne (1996) says:

'Much of this conflict between expert and lay epistemologies centred on the clash between the taken-for-granted scientific culture of prediction and control, and the farmers' culture in which lack of control was taken for granted over many environmental and surrounding social factors in farm management decisions. The farmers assumed predictability to be intrinsically unreliable as an assumption, and therefore valued adaptability and flexibility, as a key part of their cultural identity and practical knowledge.'

Wynne (1996) emphasises that these were not 'cultural' responses to 'meaning-neutral' objective scientific knowledge, but cultural responses to a cultural form of intervention.
Wynne's Cumbrian study highlights epistemological issues concerning the relationship between expert and lay knowledge which are very relevant for this thesis. It also challenges the view that scientific knowledge embedded in, for example computer-based information systems, is culturally neutral. Wynne’s work challenges us to see rational risk assessment as a tacit and furtive imposition of prescriptive models of the human and the social upon lay people. Further he suggests that in many cases these may be implicitly 'found wanting in human terms' (1996).

Wynne suggests that by re-ordering and epistemologically re-defining criteria for risk assessment, we can impose particular and problematic normative versions of the human and the social. This theme has been particularly well expressed by Charles Perrow (1984) in his book *Normal Accidents: Living with high-risk technologies*.

Perrow (1984) suggests that risk assessment is a political act, that assumes and reproduces certain social orders. Based on his experience with nuclear reactors and dams, Perrow (1984) concluded that risk assessors have a narrow focus that frequently supports the activities of elites in the public and private sector. The interest groups that commission the risk assessment argue for the importance of risk, but limit their endorsement of the approved risks to the corporate, government and military ones, ignoring risk in social and political matters (Perrow 1984).

A fixed budget, cost-benefit approach cannot take into account intangibles like potential impact on community. For example, calculative cost-benefit approaches would not be able to highlight the difference between the loss of fifty lives in a large city to the loss of fifty lives in a small village of one hundred. Perrow (1984) suggests that we need to consider the social consequences of “rational” assessments of risk which, firstly, cannot take into account unpredictable and uncontrollable local agency, secondly, cannot admit fallibility, and thirdly avoid responsibility.

In his analysis of living with high-risk technologies, Perrow (1984) emphasises the quality of the organization and the way in which it is managed as a key influence on whether or not there is a system failure. His message is that:

'...sensible living with risky systems means keeping the controversies alive, listening to the public and recognising the essentially political
nature of risk assessment. Ultimately, the issue is not risk, but power; the power to impose risks on the many for the benefit of the few.’
(Perrow 1984)

This sub-section has considered yet another way in which the concept of risk has been applied in a further web of power relations, this time noting the dependency of local lay actors upon institutions and the way in which this influences their ability to act in the face of perceived risk. In particular, it highlights the politics of knowledge and risk assessment. It has raised important issues and themes for consideration in the thesis which are summarised in table 2.3. The next sub-section will consider how major social theorists have understood the concept of risk and its role in society.

<table>
<thead>
<tr>
<th>Issues and themes raised</th>
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<tr>
<td>Scientific knowledge is not culturally neutral</td>
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<td>Imposing rational scientific risk assessment can be seen as a cultural intervention</td>
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<tr>
<td>Risk assessment is political, the power of the few to impose risks on the many</td>
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<tr>
<td>The episteme of local knowledge may be systematically neglected by experts depending upon their agenda</td>
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<tr>
<td>Universal rational assumptions about prediction and control may mean we do not respond so effectively to local conditions</td>
</tr>
<tr>
<td>Under circumstances of dependency lay people may have to act as-if they trust experts, and re-order their world accordingly, whilst remaining privately ambivalent</td>
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Table 2.3 Issues and themes raised by the environment debate

2.3.9 The concept of risk in the work of Giddens, Beck and Mandel: risk as a key modern concept and its role in transforming modernity

According to certain social theorists, risk has become a key concept in modernity. They maintain that it is important to study transformations in the nature of risk if one wants to try and understand the transformation of modernity (Beck 1992; Lash 1996; Giddens 1991; Beck 1994). Giddens (1991) suggests that the emergence of a ‘risk culture’ has become a fundamental cultural aspect of modernity in which awareness of risk ‘forms a medium of colonising the future’.
Beck (1992) and Giddens (1991) offer a similar model of the pervasive sense of risk which they argue now grips industrial society, and which is a new logic superseding that of class conflict. They emphasise the unanticipated consequences that have arisen from the use of technology, for example depletion of the ozone layer; nuclear accidents; and air pollution. These 'high consequence risks' (Giddens 1991) transcend time and space, making no distinction between classes. As Beck (1992) says, poverty may be a class issue, but smog is classless.

The consequences of these new risks are largely uninsurable; experts and modern protective institutions have let us down and not protected our ecology from unacceptably high levels of physical harm – this leads to a profound and pervasive sense of risk. Public dissent among experts has led to public mistrust and means we have to choose who to trust in a rational-calculative way. Indeed, Giddens (1997) citing the work of Mandel, The High-Risk Society (1996), has suggested that transformations in the financial model of risk may provide us with a way of managing risk in our lives.

Mandel (1996) suggests that in the current economic environment, uncertainty is now the price of prosperity. He encourages us to adopt a high risk/high return life strategy adopting using some of the latest mechanisms that have recently evolved in the way that risk is managed in financial markets, for example 'options' and 'derivatives' to distribute this risk. Mandel (1996) maintains that the way to deal with increasing uncertainty in people's lives is to offer everyone 'tools' for managing that uncertainty. 'That means moving toward the financial market model, where people have choices about how much risk, and what kinds of risks, they want to take' (Mandel, 1996).

The basis of this risk management process is that it attempts to define what may happen in the future and emphasises our ability to choose from among alternatives. Modernity has become victim of its own success and is now bringing about the disintegration and redefinition of the very conservative standards and traditions which it needs to survive. For example, it has inspired a notion of achievement and individualization which, as discussed above, has prompted women to redefine their traditional role in society and encouraged them to go out into the workplace, which has brought about a redefinition of 'the family'. We are increasingly free of
traditional roles and institutions but in turn we can no longer draw on them to sustain our identity; we therefore experience existential insecurity associated with the expansion of ‘individual choice’.

The notion of multiple futures, redefinition and reflexivity is at the heart of contemporary society and is shaping the emerging process of globalization. It is a highly appropriate focus for a hermeneutically-informed study which aims to identify multiple interpretations of an artefact, the way in which it is managed and used, and the consequences that emerge from that management and use. One of the key contributions of this study is that it attempts to understand changes in the way in which individuals interpret risk, and to connect that to the transformation of modernity currently taking place around us.

Beck’s book *The Risk Society* (1992) was one of the most influential and earliest attempts to trace the features on the landscape of the emerging risk culture and considers its consequences. Whilst Giddens (1991) focuses on the consequences of the risk culture for self-identity, a considerable part of Beck’s thesis focuses on the consequences for the organization of labour. It was therefore felt that Beck’s original risk society thesis would provide considerable insight and be an interesting ‘backcloth’ for the contributions of this dissertation. This review of the concept of risk in the discourses of major social theorists raises some important issues and themes for the construction of this thesis which are summarised in table 2.4.

<table>
<thead>
<tr>
<th>Issues and themes</th>
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<tbody>
<tr>
<td>Risk has become a key term in understanding modernity</td>
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<tr>
<td>New forms of high consequence risk are emerging which transcend time, space and class.</td>
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<tr>
<td>Traditional protective institutions have not stopped this</td>
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<tr>
<td>This had led to an increase in perceptions of risk</td>
</tr>
<tr>
<td>Public dissent among experts means we have to choose who to trust, and how to act, in a rational-calculative way</td>
</tr>
<tr>
<td>We are experiencing a disintegration and redefinition of the standards and traditions of industrial society</td>
</tr>
<tr>
<td>we experience insecurity associated with the expansion of ‘individual choice’</td>
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Table 2.4 Issues and themes raised by the social theory debate
2.3.10 Conclusion

The notion that human agents can identify multiple potential futures, and manage the obstacles that lie between them and arriving at their chosen future, lies at the foundation of modern theories of risk analysis, assessment and management. However, as we can see from this review of risk in different discourses, the assumptions behind the concept of risk in different contexts have been quite different. Some see the evolution of risk management as a good thing albeit with qualifications. The men who developed these rational, structured ways of looking at the future are heroes to Bernstein (1993, 1996). Others take a more critical view and see the theories of calculating risk as an epistemological act of power; a way that some impose a rational mindset upon others (Wynne 1996; Hajer 1996; Knights & Vurdubakis 1993).

In light of the literature reviewed, concerning the definition and re-definition of risk, it seems paramount that the assumptions underlying methods of risk assessment and management should be openly debated and form the subject of studies of the kind undertaken here. Computer-based information systems have enabled the communications and calculations necessary for a new kind of highly rational risk management. It has both enabled and mediated these processes extending the scope and speed at which they are impacting the world. Such innovations are largely developed and implemented outside of the protective institutions of society (government; political parties; trade unions), yet they have the potential to have considerable impact on the division and distribution of economic investment that shapes our society.

This thesis is interested in producing a 'thick description' (Geertz 1974) of risk, not just a thin quantitative, precise logically consistent, economical, and perhaps value free-one (Perrow 1984). A thick description recognises the situated nature of risk, the ethical and political dimension intrinsic in the process of defining the parameters for risk assessment and the consequences of prioritising rational values above the subjective dimensions of risk-taking. This approach adopts a critical stance to human-made systems and institutions, and emphasises the tentative, ambiguous nature of experience (Perrow 1984) which situates any interpretation of risk in time and
space. A thick description reflects the unanticipated, unrecognisable interactions that occur and emphasises the importance of keeping our horizons open (Gadamer 1975) in order to be responsive to emergent phenomenon in our design, development, management and use of computer-based technologies which mediate processes of risk assessment.

2.4 The theory of interpretation

This section is divided into two parts which present a description and critical review of the theory of interpretation: hermeneutics. The aim of this section is to introduce key concepts relevant to the epistemology underlying the thesis; the research approach and methodology; and the assumptions made in the subsequent analysis of the Lending Advisor case. The first sub-section details the history and development of hermeneutics, briefly reviewing the different ways in which it has been applied. The second sub-section focuses on hermeneutics in information systems research and critically reviews the seminal works of Richard Boland.

2.4.1 Hermeneutics: a historical perspective

Hermeneutics is the theory of interpretation, the root of the word lies in the Greek word *hermeneuein*, to interpret. Palmer (1969) notes that it has been connected with the wing-footed messenger-god Hermes, who is associated with the function of transmuting what is beyond human understanding into a form that human intelligence can grasp. Hermes is credited with the discovery of language and writing, the tools with which human understanding employs to grasp meaning and convey it to others (Palmer 1969).

Hermeneutics has been through different phases during which varying emphases have been put on the act of interpretation. These will be briefly outlined below in roughly chronological order. The origins of hermeneutics are as a theory of biblical exegesis. Hermeneutic theory was developed as a method of interpreting the meaning of passages in the bible, especially where they seemed contradictory or obscure. In these circumstances, hermeneutics was not so much theoretical as corollary and ancillary to the practical activity of the clergy who had completed their theoretical training (Gadamer 1975).
Hermeneutics reached its first major formulation during and after the Reformation with Matthias Flacius, a Lutheran. He proposed the possibility of universally valid interpretation through hermeneutics. During this period it was also applied and developed by Emilio Betti for judicial interpretation. He developed the notion of the 'hermeneutic circle' from the practice of civil law. This derives from the normative case where an existing law requires supplementation in order to meet changed circumstances (Palmer 1969).

The development of rationalism, and the advent of classical philology in the eighteenth century, had a profound effect on biblical hermeneutics (Palmer 1969). The task of the interpreter began to be seen as a historical one, with the emphasis on translating the bible into terms acceptable to enlightened reason. The conception of hermeneutics as strictly biblical gradually shaded into hermeneutics as a general methodology of interpreting texts.

Schleiermacher (1838) is attributed with having reconceived hermeneutics as a 'science' of linguistic understanding. He was the first to include epistemological concerns into the hermeneutic tradition. Schleiermacher's work is represented as a radical critique of philology. He formed the principles which were to serve as the foundation for all kinds of text interpretation. His notion of a universal hermeneutics starts with the assumption that the experience of the alien and the possibility of misunderstanding is a universal one (Gadamer 1975). During this period, hermeneutics emerged from a parentage of biblical exegesis and classical philology and, for the first time, defined itself as the study of understanding itself.

Through the work of Wilhelm Dilthey (1957), hermeneutics underwent a further development as the methodological foundation of geisteswissenschaften. Dilthey maintained that to interpret life calls for an act of historical understanding, an operation fundamentally distinct from the quantifying, scientific grasp of the natural world. This threw Dilthey into a debate with the dominant tradition of positivism which was to dominate the later part of his career. Although this is an important debate, the research approach taken in this dissertation adopts Giddens' view (1982),
that hermeneutics has its own epistemology and can be regarded as a methodological alternative to positivism.

In the early 1960's, Martin Heidegger, drawing on the phenomenology of Husserl (1931), maintained that hermeneutics was neither a series of scientific rules for the interpretation of a text or a methodology for the *geisteswissenschaften*, but a foundational mode of 'being in the world'. This marks another turning point in the development and definition of hermeneutics. It became connected with the ontological dimensions of understanding and identified with the phenomenology of existence and of existential understanding.

The work of Heidegger was further developed in the mid-1970's by Gadamer (1975) into a systematic work on 'philosophical hermeneutics'. He asserts that the phenomenon of understanding pervades all human relations to the world (Gadamer 1975). He carries hermeneutics into the 'linguistic phase' (Palmer 1969), with his controversial assertion that 'Being that can be understood is language'. This plunges hermeneutics into the fully philosophical questions of the relationship of language to being, understanding, history, existence and reality.

Having considered the many different ways in which hermeneutics has been interpreted, the next sub-section will consider Richard Boland's particular interpretation of hermeneutics in information systems research. His inspired work had considerable influence on the development of the thesis in this dissertation. A critique of his work proved to be a starting point for the particular understanding of hermeneutics employed in this thesis which both informs the underlying epistemology and the methodology.

### 2.4.2 Hermeneutics and information systems research

During a conference in 1984, Boland proposed that information systems research could profitably draw on the hermeneutic tradition to structure its inquiries (Boland 1985). Boland's main philosophical sources have been the phenomenology of Husserl (1931), and the hermeneutics of Ricoeur (1965) and Gadamer (1975). His work has questioned the orthodox understanding of the information concept (Boland 1987,
and suggested that research in information systems can be seen as the study of how texts are produced and read in modern organizations (Boland 1990).

Boland, drawing on Ricoeur's metaphor of 'life as text', considers that our everyday experience of the social world is a hermeneutic and that in the world we encounter a 'text' of meanings already made and being made (Walsham 1993). He suggests that: 'In using an information system, the available output is a text that must be read and interpreted by people other than its author. This is a hermeneutic task. In designing an information system, the designer reads the organization and its intended users as a text in order to make an interpretation that will provide the basis for systems design. This is also a hermeneutic task. In studying information systems, social scientists read the interaction during systems design and use in order to interpret the significance and potential meanings they hold. Hence, doing research on information systems is yet another hermeneutic task' (Boland 1985).

Boland's approach is stimulating and the reflections on practice, especially in Boland and Day (1989), are thoughtful. His emphasis on interpretation as universal to life, and particular focus on the interpretation process involved in information systems development, offers a valuable shift in perspective from the positivist research which is so prevalent in information systems field.

Boland's contribution to the debate regarding the concepts of information and data is an important one for this study. Boland shifts our focus from the notion of a machine providing information and instead stresses a process of 'appropriation' by the individual in which they invest data with meaning and then interpret it as information (Boland 1991). This provides us with an interesting and critical perspective on computer-based decision support systems. It prioritises the users' thought process, and emphasises the value of their interpretive expertise.

Despite Boland's obvious dedication to achieving a practical orientation to the application of hermeneutic concepts, there would appear to be a number of difficulties with some aspects of his approach. For example, he does not explore the double hermeneutic concept (Giddens 1982, 1984, 1991) in his work. His interest in language
is also not really developed in his early writings, although later research adopts the theme of narrative (Boland and Schultze 1996). Despite asserting that hermeneutics is a valuable way of looking at information systems in organizations, his own use of case studies is limited. Lastly, although Boland asserts that a greater awareness of hermeneutics would change the way that we develop information systems, there is no suggestion as to how this would work in practice within organizations. These criticisms can be illustrated with some examples from his work.

In his article with Day (1989), Boland states that their aim is to conduct a phenomenological study to produce a set of statements that reflect the essence of a information systems developer's experience during a project. These statements are put forward as the 'most general, necessary and invariant features of the system design experience that emerged from repeated attempts to bracket the accidents, contingencies and particular circumstances of this situation' (Boland and Day 1989). Whilst appreciating that they are looking for a particular kind of interpretation as a result of their systematic, critical reflection and phenomenological study, Boland and Day appear to be focusing on patterns more appropriate to a natural science investigation. They discount the very richness and complexity that makes a context unique. Gadamer argues that 'one has not properly grasped the nature of the human sciences if one measures them by the yard stick of an increasing knowledge of regularity...Its ideal is rather to understand the phenomenon itself in its unique and historical concreteness' (Gadamer 1975).

Boland and Day (1989) go on to say that their study "...started with an attempt to suspend theories about systems development". The idea of 'bracketing their experience' (Boland and Day 1989) would suggest that they are attempting to insulate their research in a way that is inappropriate to hermeneutic study, where prejudice is valued, and unappreciative of the double hermeneutic concept (Giddens 1982, 1984, 1991). Boland leaves Giddens' double hermeneutic concept undeveloped in his work. Yet, the double hermeneutic is surely a considerable concern of all research and particularly important to information systems. A double hermeneutic occurs when a person, or group of people, interpret and respond to an interpretation of their actions, for example, in an interview with a researcher; during requirements analysis or knowledge engineering; or in negotiations with a boss. To describe work processes
within an organization in a valid way is in principle to be able to participate in the forms of life which constitute, and are constituted by, that behaviour. This is already a hermeneutic task. But the field of computer-based information systems is itself a 'form of life', with its own technical concepts. Hermeneutics therefore enters information systems development on two, related levels.

When interacting with technology, information systems professionals are analysing an object world that does not answer back or construct and interpret the meanings of its activities. However, once they move into the social world of the organization, they are confronted by a constant situation of feedback. Users discuss and interpret the possible effects of the computer-based information system, for example the organization's motivation, and respond to the information systems development from this flux of knowledge.

Once a researcher enters this arena, their 'findings' can be taken up by those to whose behaviour they refer. This will be compounded by the 'Hawthorn Effect' whereby actors change their behaviour if they know they are being observed. This may be a phenomenon which can or should be marginalised, but it is integral to their very nature. One need only pick up a daily newspaper to see that the general public are going to be 'prejudiced' by articles on the capability of technology that they read, and have certain expectations as a result of the research advances reported there.

The process of computer-based information systems development is rich in interpretation. The participants and stakeholders in computer-based information systems projects span different traditions. They use different vocabularies and concepts to describe their worlds. The user interprets their world of work and then describes it to the analyst. The analyst interprets the user's description and then translates it into code. There is no morally separate or transcendentally neutral met-langauge with which to describe the process of systems development. The interpretation within the description will be normatively as well as conceptually linked to the subject matter.

Winch (1958) refers to the 'logical tie' between the ordinary language of lay actors and the technical terminologies invented by 'experts'. Many researchers following a
positivist methodology try to replicate the insulation of natural science as far as possible. They understand the double hermeneutic only in relation to prediction, in the shape of 'self-fulfilling' or 'self-denying' prophecies. The tie between ordinary language, daily social life and theory is specifically regarded as a nuisance, something which gets in the way of testing predictions and validating generalisations (Giddens 1982). They argue that they are 'not interested in superficial top-of-the-head statements of an individual's feelings or attitudes about systems design' (Boland and Day 1989). Their statements are 'not merely empirical statements of what was observed during the design project' (Boland and Day 1989). If, however, as Gadamer argues, we recreate society in every moment through our 'way of being' in the world, then 'top-of-the-head statements' and empirical observations, 'accidents, contingencies and particular circumstances of the situation' are an integral part of our context. Boland and Day's dismissal of these phenomena would seem to contradict the hermeneutic nature of their study.

One of the difficulties in writing interpretive, hermeneutically informed research is often our own historical tradition. If we have ourselves been trained in positivist methods, and educated via a natural science-oriented vocabulary, this can seep through into our research. Whatever the methodological and theoretical basis of generating the systems designer's statements, the reflections on information systems development in Boland and Day's (1989) article are thoughtful. As Boland says, the truth of them is whether they become present to the IS community, not whether or not people attempt to disconfirm them.

2.4.3 The use of hermeneutics in this thesis

Whilst respecting Boland's pioneering work using hermeneutics in the information system's field, this thesis rejects his use of the text as a metaphor for life (Ricoeur 1981) and instead adopts the philosophical hermeneutic of Gadamer (1975). Life is not a static text from which we can distance ourselves or put back on a book shelf; life answers back and insists upon our interaction, not just at the level of interpretation, but through human agency and symbolic interaction.
For these reasons, the 'philosophical hermeneutic' of Gadamer was felt to be more relevant to information systems research. Gadamer suggests that the phenomenon of understanding pervades all human relations to the world (Gadamer 1975). Exploring multiple interpretations in the context and process of organizational change reveals useful insights from both a local perspective that concentrates on implementation and use of computer-based information systems, as well as on a 'macro' level which explores broader societal issues.

One of the most important messages conveyed by hermeneutics for research is the notion of keeping one's horizons open. As Gadamer (1975) argues, we need to recognise our prejudice and presuppositions as the boundaries of our horizon. As we move through our lives, and especially in interpersonal dialogue, we have to see through the limits of our prejudice and open ourselves to that of others (Boland and Day 1989).

This approach may inform individual research and, indeed, has been applied by a number of other authors, for example Introna (1993, 1997); Wastell (1994); Lee (1991, 1993). However, it would be difficult to bring into more general practice within organizations except as a suggestion or recommendation. There are, however, computer-based information systems development methodologies, like SSM (Checkland 1981; Checkland and Scholes 1990) and ETHICS (Mumford and Weir 1979), which are based upon a pluralist perspective recognising the different agendas and world view of the stakeholders in a project. The aim of these methodologies is to acknowledge and hopefully incorporate the individual's interpretation of the project process.

Hermeneutics therefore informs both the underlying epistemology and the interpretive methodology in this thesis. Interpretive methods start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors and that this applies equally to researchers (Walsham 1993). Different interpretations of reality form complex interacting contexts within which the information system, as a human artefact, is drawn on and used to create or reinforce meaning (Walsham 1993). These multiple interpretations can be particularly revealing in a context of organizational change, as documented in the Lending
Advisor case study, when resources are being reallocated and their status re-interpreted.

Finally, the last chapter of the thesis, briefly reflects on the strengths and weakness of this hermeneutically-informed research approach during the course of the three and a half year study.

2.5 Decision support systems

This section is divided into three sub-sections. The first sub-section briefly reviews some of the relevant literature concerning DSS and decision-making. The second section presents definition of a decision support system and critically reviews the work of Mark Silver (1990). Silver's work emphasises the need to study how decision support systems affect decision-making, rather than adding to the prolific literature on design. This provided an early research focus for the thesis, which developed into an interest in decision support systems in context. The reflexive relationship of the decision-maker with their environment is discussed in the analysis chapters.

The final sub-section outlines some 'predictions' about the impact of technologies like Lending Advisor on organizations and briefly considers the social construction of expectations or technological 'litanies' in the information systems literature.

2.5.1 The decision support system and decision-making literature

Much of the early literature concerned with decision support systems focused on design and development issues (Keen 1980; Keen and Gambino 1983; Moore and Chang 1983; Stabell 1983; Reimann and Waren 1985). As an evolving technology there is still considerable interest in innovation at this level (Braunstein, Lauer et al. 1991; Sloan and Green 1995; Spiegler 1995; Sauter 1997). Studies of decision support systems in the financial services tend to describe design and development innovations with the aim of recommending their use in organizations and discussing the design issues related to their diffusion (Gerrity 1971; Duda, Hart et al. 1987; Trippi 1990; Mareschal and Brans 1991; Mulvey 1994; Sisko, Zopounidis et al. 1994).
In this thesis the specific technology is acknowledged as shaping local possibilities, however, decision-making - and the technologies that mediate it - are regarded as being socially constructed and fundamentally situated in social, economic and political human communities. Of the early literature Winograd and Flores' (1986) exploration of computers and cognition, drawing on the work of Martin Heidegger (1962) provided the most insights for the development of a situated perspective.

There were a small number of DSS studies from an organizational perspective amongst the early literature, but these tended to be written from a traditional, rational, cognitive-behavioural or management science perspective (Keen and Scott Morton 1978; Alter 1980; Hackathorn and Keen 1981; Sage 1981; Anderson 1983). There has been some interesting research more recently from a broader perspective which, for example, considers the influence of cultural context on decision-making (Bingxun and Angell 1990); and explores the notion of distributed cognition (Tenkasi and Boland 1993; Boland, Ramkrishnan et al. 1994; Bowker and Star 1994; Hutchins 1995).

A growing concern that the complex nature of decision-making and expertise were being over-looked by computer scientists generated a literature focused on the management and use of decision support systems. This literature was particularly insightful in the formulation of this thesis. The Lending Advisor decision support system in the case study challenged the professional expertise of the local branch manager. The socially constructed nature of expertise and decision-making is a theme taken up by authors like Agnew, Ford and Hayes (1994) and Whitley (1996).

The early work of Irving Goffman (1956) was particularly inspirational from this social construction respect. He considers the 'front stage' and 'back stage' aspects to the construction of expertise in communities. The essential contribution of community in the process of decision-making is further emphasised by Harry Collins (1990). Use of the Lending Advisor decision support system also raised important issues regarding essential creativity in the market place and the work of Joyce Elam on decision support systems and creativity was particularly noteworthy here (Elam and Mead 1987; Elam and Mead 1990).
There are some useful reviews of DSS literature (Alter 1977; Eom and Lee 1990; Silver 1990; Eom 1996; Eom 1997), but again most of them assume an interest in design and development issues. One exception is the work of Mark Silver (1990) and the next sub-section will critically review his contribution to this thesis.

2.5.2 Definition and research focus

In his excellent review of the DSS literature, Mark Silver (1990) traces the roots of decision support systems to a convergence of interests in three related fields: management information systems, operational research and management science. The first articulation of the 'decision support systems' concept was in the 1970's by Scott Morton (1971) and Peter Keen (1978)

A proliferation of definitions exist for decision support systems and there is no one that is agreed upon by all in the literature. Silver suggests that the variance in the definitions can be accounted for by three influences in the field: early research activities; on-going technological advances; and marketplace definitions (Silver 1990).

When decision support systems began to be developed researchers tended to study a small number of systems from which they generated their definition. As the technology developed, these definitions inevitably were not felt accurate enough to endure, and researchers refined their definition according to the developments in their studies. This generated a large number of quite narrow definitions, and a rather inward looking debate. The situation was compounded once decision support technology had established itself commercially, as developers felt the need to differentiate their products by 'selling' their own definitions.

Silver proposes a broad definition which shifts the emphasis away from tinkering with definitions, and invites researchers instead to concentrate on systematically describing their system in a way that is useful to other researchers. He maintains that: 'The multiple, conflicting, narrow definitions we have now make the term meaningless as a

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* As Silver notes, two notable exceptions are Alter (1977, 1980) and Keen (1980).
basis for communication among researchers and between researchers and practitioners. Researchers constantly draw conclusions about DSS that depend on how they have defined them' (Silver 1990).

Silver's broad definition of decision support systems was considered to provide the most useful starting point for this discussion. It is as follows:

'A decision support system is a computer-based information system that affects or is intended to affect how people make decisions'.

(Silver 1990)

It was felt that Silver's emphasis on understanding the affect of decision support systems on everyday work practices was the closest to the aim of this study. Adopting this definition allows the field to build a cumulative knowledge base of DSS and to consider if the differences in findings are semantic or substantive. He argues that the preoccupation with definition and prescription in the past has led researchers to ignore the central issue in DSS: the support of decision making.

Silver's (1990) definition of decision support systems, whilst broad, is not 'a melting pot'. His intention is that researchers go on to use the framework that he proposes to construct a detailed description of the decision support systems they are studying. The framework provides what Silver hopes will become common terms and a classification scheme for studying DSS to help us understand 'where we have been and where we should be going' (Silver 1990). 'It invites us to step back from our positions as researchers or practitioners, to step away from whatever perspective of DSS we have adopted, and to contemplate the intricacies of the field as a whole, to recognize the elemental concepts and the connections among them. It is a way of organizing the knowledge necessary for comprehending the complex world of computer-based decision support. Some of that knowledge has already been acquired; more is still wanting' (Silver 1990).

Whilst Silver's definition and general research approach was felt to be very useful, his descriptive framework proved not to be so. His emphasis on the specific technology and affects of DSS was studied seriously, but taken up in a different way by adopting a multi-level analysis (discussed in the next chapter) rather than developing a 'Silver
framework'. It was felt that his approach did not recognise the situated nature of decision support systems and expertise. For example, in the above quote, Silver implies that the researcher can 'step away' from their perspective to recognise the 'elemental concepts' that make up DSS issues. Having adopted a hermeneutically informed approach, this study assumes that 'we begin by being in the world' (Heidegger 1962) and cannot step out of our prejudice as Silver's rational approach implies. However, despite these criticisms, Silver's work proved an important 'springboard' for the thesis.

Silver's emphasis on the details of the technology used in the design of the Lending Advisor decision support system is our next consideration. Decision support systems can draw on a variety of basic technologies. The underlying technologies of decision support systems are often database management and dialog management software and, timesharing systems or personal computer hardware. Groupware, internet and web technologies, graphics, model management and artificial intelligence are being increasingly used as DSS technology. The particular interest of this thesis is the inclusion of artificial intelligence in computer-based decision support systems.

In recent years artificial intelligence components have been applied in decision support systems to provide 'decision guidance' (Silver 1990). As mentioned earlier, decision support systems are the product of a post-second world war 'marriage' of operational research and management information systems. Early DSS's combined the modelling ability of operational research with an interest in user interface informed by management science. Incorporating artificial intelligence was a natural development as it offered advanced modelling ability, albeit developed in a less applied environment, which proved highly compatible with, for example, the emerging quantitative theories of risk management.

Decision support systems which include advanced modelling, developed by artificial intelligence researchers, are usually known as 'expert systems' or 'knowledge based information systems'. Lending Advisor was described in the corporate newsletter (March, 1994) as 'a complete commercial lending application built around a unique "knowledge based" computer system, for use by lenders to the middle/large business sector'. Lending Advisor was 'sold' to its users as a knowledge-based expert system.
For these reasons the terms DSS and expert system are sometimes used interchangeably in the thesis when referring either to Lending Advisor or similar computer-based technologies with an artificial intelligence component. The degree to which expert systems 'restrict' or 'guide' decision-making has important implications for its management and use which are considered further in the analysis chapters.

The next sub-section briefly reviews the predictions made in the decision support and expert systems literature. It is suggested that there is a strong element of hyperbole about such statements which makes informed, longitudinal studies such as the Lending Advisor a valuable contribution.

2.5.3 Decision support and expert systems: predictions in the literature

George and Tyran (1993) note that although the impact of expert systems is not yet well understood, there are many predictions about what they are likely to be. They compare these predictions with those made by Danziger (1977) about conventional data processing in organizations, and find considerable similarities. They argue, with Kling and Iacono (1988), that as technologies evolve certain groups seize upon them as the foci of computerization movements. A 'litany' of claims are made for each technology which is heralded as the enabling technology of a new social order.

One recent example of this kind of literature is Hayes-Roth and Jacobstein (1994) who attempt to identify near and long term needs for future improvement in knowledge based systems based on the assumption that its current limitations can be overcome. They 'envision' a borderless society of knowledge workers and assert that the integration between human and knowledge agents will be 'seamless' (Hayes-Roth and Jacobstein 1994). George and Tyran (1993) maintain that few of these claims are realised, and the technology in question is soon cast aside as computerization movements shift their focus to a new technology.

George and Tyran (1993) propose the following six-part litany of predictions about the impact of expert systems:

Expert systems will reduce staff.
Expert systems will reduce costs.
Expert systems turn mountains of data into molehills.
Expert systems improve decision making.
Expert systems increase a supervisor's ability to manage subordinates.
Inadequate utilization of expert systems is due to resistance or failure to understand expert systems.

Such predictions were an interesting consideration during the case study and care was taken to gather data regarding the stakeholder's expectations. The impact of the Lending Advisor expert system was eventually considered in detail in the subsequent analysis. The next chapter describes the research approach and explains how the case study was conducted and analysed.
Chapter Three

Methodology

3.1 Introduction

This chapter is divided into five sections which detail the methodological approach of this research. The first section of the chapter opens with a discussion of the methodology debate in information systems research. It is suggested that this debate makes it important to be explicit about the choice of research method and the implications that follow from its epistemological stance. Choice of methodology does not take place in a vacuum and the first section considers the various influences that might shape our decision. The reasons for choosing an interpretive research method are then briefly outlined.

The second section begins by exploring the roots of interpretive methodology and suggests a broad definition. Interpretivism is based upon a set of epistemological assumptions, and it is suggested that how one interprets them, in the practical application of research, is one way of defining variations within interpretive approaches. The method used in this study is then located within this spectrum of interpretivism. The section continues with a discussion about qualitative methods, and why they were found to be the most appropriate for this study. It concludes by introducing an ethnographic technique that was used to both support the fieldwork effort and inform later data analysis.

The third section considers the way in which research questions emerge during interpretive research and introduces the areas that provided the focus for this study.
The fourth section details the field work plan. It describes the interview process and the dynamic between the researcher and the interviewees. This is written by way of a 'confessional', including reflections on the power relations implied in these dynamics and the ensuing trials and tribulations during the research process.

The final section describes how the field data were analysed, and introduces the multi-level approach used in this study. It attempts to provide the reader with a sense of how some of the high-level principles discussed in the chapter translated into practice. The reader is guided through the process of analysis from fieldwork notes, to identification of themes, and formulation of the thesis. This process is highlighted using an example from the thesis. The role and status of social theory is discussed with particular emphasis on how they were used to shape the thesis. Finally, the multi-level presentation of the analysis is described.

### 3.2 Choosing a research methodology

The last decade has witnessed a debate in the information systems literature concerning methodology and epistemology (Lee 1991; Orlikowski and Baroudi 1991; Walsham 1993). In their 1991 study of research approaches in the information systems field, Orlikowski and Baroudi found that 97% of the 155 articles that they sampled adopted a single research perspective: positivism. Although the field has searched quite widely through multi-disciplines for useful theoretical and conceptual schemes to communicate information systems research, it has traditionally conformed to a positivist perspective ‘regarding the nature of the phenomena studied by information systems researchers, and what constitutes valid knowledge about those phenomena’ (Orlikowski and Baroudi 1991). Orlikowski and Baroudi (1991) suggested that this is unnecessarily restrictive: ‘To the extent that one believes that the social phenomena studied within these fields are complex, the existence of a plurality of perspectives allows the exploration of phenomena from diverse frames of reference’.

In 1993, Walsham noted that the ‘hegemony’ of positivist research was gradually being replaced by ‘a more pluralist scene’ (Walsham 1995). One sign of this was the changes that began to occur in the editorial statements of journals and in calls for
conference papers which now appeared to solicit research representing a broader range of methodological approaches (Walsham 1995). In 1997 there will be an IFIP 8.4 conference devoted to interpretive research and a special edition of *MIS Quarterly* focusing on qualitative research to testify to these shifts in attitude.

Bruno Latour (1987) examines research rhetoric in his book *Science in Action: How to follow scientists and engineers through society*, and suggests that when research is dominated by an orthodoxy to which authors conform, detailed statements referring to this conformity are rare as their choice is taken for granted. Since this research is being written in the context of a methodological debate, care will be taken to be explicit about the choice of research methodology, not with the aim of contributing to the 'methodological pestilence', as Max Weber once described a similar debate in the social sciences, but with the intention of going beyond this introspection to chart new territory.

Rather than a reactive discussion justifying why the author has not pursued a positivist approach, this chapter will concentrate on defining characteristics of the particular interpretive methodology adopted in this research, how and where it focuses the research, and the unique value that this brings to information systems research. By concentrating on exploring what the methodology *is* rather than what it *is not*, the intention is to further the debate by contributing to a better understanding of interpretive methodologies.

Before we embark on this exploration of interpretivism, it should be noted that choice of methodology may be shaped by a range of influences in *addition* to the above debate in the information systems literature. Orlikowski and Baroudi (1991) suggest that research approaches adopted ‘are influenced to a greater or lesser extent by the various institutional contexts within which researchers are trained and work....They are heavily influenced by the doctoral program attended, the agendas of powerful and respected mentors, the hiring, promotion and tenure criteria of employing institutions, the funding policies of agencies, the rules of access negotiated with research sites, and the publishing guidelines of academic journals.’
Choice of methodology may, to a greater or lesser degree, be shaped by these influences, but it is further suggested by Martin Trow that most researchers also have their 'favourite research methods with which they are familiar and have some skill in using. And I suspect we mostly choose to investigate problems that seem vulnerable to attack through these methods' (Trow 1957). The methodology in this study was chosen because it satisfied the ontological interests and integrity of the author, as well as appearing to be the most effective approach for this specific research project.

Both the interpretive research method, and the qualitative technique employed here, are interested in informed description of 'complex, dynamic social phenomena that are both context and time dependent' (Orlikowski & Baroudi 1991). The computer-based decision support system at the centre of this research is a new phenomenon, not only for UK Bank, but also for the UK banking sector as a whole. It therefore felt more appropriate to employ a methodology that focused on understanding the complex social processes involved rather than attempting to measure them. Having outlined the reasons why this methodology was chosen, the chapter will now expound on the definition, nature and consequences of this choice.

3.3 Definition and choice of interpretive stance

The interpretive perspective has been receiving increased attention and popularity in many social science fields, as well as in information systems research, and it is there that it has its roots (Orlikowski and Baroudi 1991). It may be worthwhile pausing to consider the implication of these roots, since this may account for the, sometimes vague, way in which interpretive researchers attempt to loosely align aspects of their work with anthropology and ethnography. Having said that this chapter will not indulge in 'anti-positivist' rhetoric, it is difficult to avoid briefly mentioning positivism when discussing the roots of interpretivism.

Contemporary interpretive research methods were developed in anthropological research as a reaction against prescriptive approaches to culture (e.g. Tylor). Early research in anthropology adopted a comparative method which presumed that all human cultures are instances of a species-specific, but nevertheless universal culture, and that they all develop with the same sequences of stages (Spender 1989). The
consequence of rejecting this view, as researchers like Boas did, is to focus the research effort on understanding the subject’s own construction of meaning. Accepting the primacy of the subject’s view, with its evident strangeness, brings uncertainty, and the subject’s part in its resolution, into the centre of analysis (Benedict 1959).

Positivist methods are based upon inductive reasoning which seeks to prove or disprove hypotheses through a process of replication. It focuses on developing an increasingly closed and mature rationality. Interpretive approaches accept the subject’s rationality, and attempt to explore how their sense-making informs us about situated social processes.

In his book *Interpreting Information Systems in Organizations*, Walsham (1993) gives a useful description of the interpretive tradition as follows:

> 'Interpretive methods of research start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors and that this applies equally to researchers.'

The word ‘description’ is used advisedly here in the opening sentence, since so many researchers using interpretive methods seem to avoid rigid definition, preferring instead to present their approach as a set of philosophical assumptions set in contrast to positivism (Orlikowski and Baroudi 1991).

Indeed, although many information systems researchers, particularly in Europe, draw on the work of Walsham (1993), it is notable that he refers to his own research perspective as ‘broadly interpretive’. Care is needed, therefore, when using the term ‘interpretive’, as there is considerable scope in the practical application of the philosophical assumptions underlying it, which may impact the nature of the findings that arise from research.

This section will now explore the nature of the interpretive research approach that has been chosen (see figure 3.1). The most important difference between interpretivism
and other approaches is at the epistemological level. As Orlikowski points out (Orlikowski and Baroudi 1991), this also has implications at the ontological level and the two levels are usually, but not necessarily, bound together to some degree. This is a cautious statement, as a researcher could take an interpretive stance at an ontological level, but for practical or political reasons adopt a positivist method of research and, one supposes, vice versa. Since such distinction between ontology and epistemology is not relevant in this thesis, the following discussion will be confined to epistemological issues with an assumption these satisfied ontological interests of the researcher.

The use of an interpretive research method implies 'an epistemological position concerned with approaches to the understanding of reality...asserting that all such
knowledge is necessarily a social construction and thus subjective' (Walsham 1993). Orlikowski and Baroudi (1991) note that interpretive approaches differ in the degree of social constructivism that they support. ‘This difference between weak and strong constructionist positions has implications for how interpretive research relates to research conducted in the positivist mode' (Orlikowski and Baroudi 1991). If one adopts a weak constructionist view, there are possibilities for the combination of positivist and interpretive methods (Lee 1991; Gable 1994).

The stance taken here is a strong constructionist view which maintains that interpretive methods cannot be used in conjunction with positivistic beliefs. This is due to the fundamentally different philosophical traditions from which they have emerged. Interpretive methods are taken here to be an alternative to positivism, not a compliment to them. Interpretive methodology is still being developed in information systems research, and one of the problems that has emerged, particularly among the strong constructionists, is the tendency to rely on it as a replacement for positivism, without necessarily locating their individual approach within the range of interpretive approaches while it is in this process of development. There is a spectrum of interpretive research which is made distinct by its philosophical basis. One way of locating one’s work in the developmental spectrum of interpretive method therefore, is to be explicit about the philosophical basis one’s own work and show how different philosophical emphasis affects the focus of the research.

Mingers (1984) identifies four different strands of thought that can be sustained by an interpretive research method: phenomenology (Zuboff 1988); ethnomethodology (Suchman 1987); the philosophy of language (Lyytinen 1985; Lyytinen 1987); and hermeneutics (Boland and Day 1989). These ‘variations’ would seem to indicate considerable diversity within interpretive research which supports the call for researchers to be explicit about the kind of interpretive research being conducted; what their research is rather than what it is not.

The argument for this is a good one; methodologies are not neutral axiomatic principles, and this makes it important to carefully consider the philosophy behind a chosen methodology. Walsham (1993) calls for authors to ‘include clear statements in
their papers of their epistemological stance, and the nature and strength of the claims that they are making for their results'. Orlikowski and Baroudi (1991) remind researchers that ‘They should understand and acknowledge the extent to which the perspective they adopt will focus their attention on some things and not on others, and bias their perception of the phenomena they study’.

The philosophical underpinnings of the interpretive approach taken in this study lie in the social constructivist approach of Byker, Hughes and Pinch (1987) and Latour (1987), and is informed by the hermeneutics of Gadamer (1975). The method used to conduct the case study derives from ethnography and emphasises the primacy of the subject’s view. To be specific, it drew from Evans-Pritchard’s (1951) three phase method developed during his study of the Nuer. This method involves firstly, learning about the culture being studied; secondly, critically reflecting upon interactions observed and experienced; then finding a form through which to communicate these experiences to the wider research community.

A further distinctive characteristic of interpretive research methods is its emphasis on the need for detailed understanding of human meanings and processes in context (Walsham 1993). Meaning cannot be understood independent of context because the two are inextricably bound; as Heidegger (1962) says 'We begin by being in the world' (my emphasis). One of the fundamental premises of interpretivism is that organizational structure and social relations are not objectively known or unproblematic (Orlikowski and Baroudi 1991). As a consequence, this research method leads us to focus on the ‘processes of organizational stability and change’ associated with the introduction of a computer-based decision support system and highlights the ‘linkages between context and process’ (Walsham 1993).

3.4 Qualitative research method

Qualitative research methods were felt to best support this focus on context and process. Van Maanen (1982) defines qualitative methods as:

'...an array of interpretive techniques which seek to describe, decode, translate and otherwise come to terms with the meaning,
not the frequency, of certain more or less naturally occurring phenomena in the social world.'

In 1982, Van Maanen (1982) noted that qualitative methods were not frequently used in organizational research, and well established practices were hard to find. Since then, they have been increasingly used in IS literature, for example in the work of Markus (1983); Suchman (1987); Zuboff (1988); Boland & Day (1989); Orlikowski (1991); Walsham (1993); Starr (1991); Jones (1993); Barrett (1996); Sahay (1997). However there is great variation in practice. Van Maanen (1982) suggests that this is because qualitative researchers are ‘playful, experimental, unconventional, because few feel the problems of organizations are themselves well defined'. This does not relieve us of the task of attempting to define our own method.

There are two basic stances in qualitative research according to Van Maanen: insider or outsider. There is considerable debate about the relative virtues of different possible roles for the researcher in the case study. In action research, the researcher is employed by the case study organization, and therefore whilst he or she can become closer to the context of the study, they also have a vested interest in the outcome of the project. If the researcher’s interaction focuses a number of repeat visits over a long period of time, and they see themselves as an outsider, as it was in this study, both the interviewer and interviewee can cast a fresh glance at the events between visits. This has the advantage of making changes in process and context, which might have been subsumed by everyday contact more apparent. Inevitably though, without the proximity that action research affords, there is a different understanding of the context.

‘Whatever the decision made by the individual researcher, it is essential that the choice is made in an explicit and reflective way, and that the reasons are given when reporting the results of the research’ (Walsham 1996). On one level this was not an issue, since the opportunity to conduct action research did not present itself. In many senses, however, there is no such thing as a ‘pure insider’ or a ‘pure outsider’. In this project the researcher was presented to the participants in the case study as a university research student. She received no consultancy fees and was at no time
employed by the organization. In this respect she was an 'outsider'. However, the researcher's father had been an employee of UK Bank for 40 years, and in many instances this tended to identify her with some of the interviewees as a 'quasi-insider' (Woolgar 1988).

This last point may be worth further comment. During some of the interviews with the group of managers/users within UK Bank, I was aware of a gender-based power dynamic emerging, which may possibly have been due to the father/daughter dimension to my research. In most incidences the interviewee had not known my father personally; however, it would seem that just the awareness that I was a daughter of an ex-bank manager would engender a certain father/daughter dynamic. It tended to surface mostly with the mature managers, particularly those in the Cambridge region where my father used to work as a manager. These managers would perhaps begin sentences with comments like 'You are too young to remember this, but your father would' or make particular use of my name: 'Look, (pause) Susan, what you have to understand is...'. On the one hand the 'low volume' father/daughter sub-text was mildly irritating, on the other it gave me unique insight into the 'soft underbelly' of the manager's lives. Most managers did not indulge so obviously in this gender play, but there was a tendency to treat me as 'part of the extended family' in some cultural sense.

A retrospective reflection on this dynamic inspires many thoughts, but there are two that seem most interesting to a wider audience. Some kind of power relationship is inevitable in any kind of social interaction. It may be that I was sensitised to this particular dynamic because my father regularly confronted sexism in the bank culture. My background provided me with an immensely valuable stock of cultural know-how in terms of language, norms, values and beliefs. However, I was also aware that my appreciation and first hand experience of the 'local' may have made me empathetic to the bank manager's plight, and I remember consciously pushing myself to see other perspectives. This was made easier by the realisation that, in common with most bank managers, whilst I was concerned to see aspects of local knowledge devalued, I was very glad to see some of the traditional hierarchy and behaviour swept away during this period.
The father/daughter dynamic may have provided some managers with a mental slot in which to put me, since I was not a customer, or a friend or family, and was perhaps too young and female to be a Cambridge academic (!). Yet here I was paying them attention and interested in their life experiences. The second, and perhaps most important, aspect of this interaction was that it showed me that status and experience were very important to these individuals and that certain, quite macho, masculinities (Knights and Murray 1995) were attached to their work identity. For example, this was shown by the quite frequent use of war metaphor (Knights and Murray 1995) in their language when talking about cases of conflict at work.

It should be emphasised that these gender-based power dynamics were not the defining characteristic of the interviews nor were the managers aggressive towards me, on the contrary they were very courteous, generous with their time and could not have been more helpful. However, these subtle gender-based power 'inflections' highlight more general social norms which are rarely commented on in the research process. One of the interesting aspects of conducting a longitudinal study is that these reflections develop over time and provide insight into the norms, values and beliefs in a particular culture.

The longitudinal case study option was chosen because it compliments and supports the interpretive approach that underpins the study. It focuses on context and process over time both of which, as mentioned above, are very important to interpretive research. The choice of case study is acknowledged as highly dependent upon circumstances and access opportunities. During a series of preliminary research interviews across a number of sectors, the Lending Advisor decision support system was identified as a leading edge system which was evoking considerable interest. Prior knowledge of the organization in the case study led to a sense that this computer-based information system could potentially have a major impact on the working lives of managers who would be using it. The case site was also interesting because it is in a sector that is going through an historic and dramatic transformation.
A longitudinal case study method provides valuable insights into the processes and transformations that occur over time. This case study began in 1993 when Lending Adviser was in its pilot stage, and followed the implementation of the system through to 'business-as-usual' status. A certain amount of historical reconstruction was therefore necessary for the events that occurred before 1993. But, after this point, the researcher was in a position to follow events and shifts in interests and resources.

Some researchers rely almost exclusively on historical reconstruction as a source of data, rather than conducting longitudinal case studies themselves. There are certain advantages to this approach; for example, it costs considerably less in terms of time and resources. Philosophically there is little distinction between the two approaches, as each represents another interpretation of a set of events. However, the research that it generates will offer different qualities and these should be noted. For example, shifts in perception and representation that occur in time and space have to be considered quite carefully. In historical reconstructions, unintended consequences and major impacts of events are already known; therefore, narratives are constructed in that light. When one conducts longitudinal case studies one is sensitive to emergent issues and must, therefore, be vigilant regarding the time and place that data are gathered.

Van Maanen (1982) says that, in undertaking qualitative research, it is important to 'recognize the limitations of the path that you have embarked on. The artistry in the craft of qualitative research is to be found at the boundaries of any given study' (1982). Some such limitations became apparent in the course of this study, and these will be discussed further in the final chapter.

### 3.5 Research questions

Since the research was embedded in an interpretive approach and philosophy, it would have been inappropriate to enter the fieldwork with a positivist hypothesis or rigid, definitive research questions. This thesis, therefore, began with an overall premise or assumption that computer-based information systems both enable and constrain change within organizations (see figure 1.1). This was developed primarily from Shoshana Zuboff's (1988) work and, most particularly, her concept of 'informate'. It
was felt that the contradiction inherent in this concept highlighted some important concerns for the management and use of computer-based information systems.

When formulating a research focus a balance needs to be found between a ‘blank piece of paper’ and the possibility that reading too much literature on the topic area before the case study is conducted may lead to overly biased findings. A critical reading of key texts plays a key role in informing expectations, but one should also remain open to the unexpected. Indeed, a study of hermeneutics encourages us to acknowledge both the value and inevitability of ‘prejudice’. Further, from a practical research standpoint, it is important to appreciate pre-learning as an integral part of a ‘cumulative research approach’ (Walsham 1993).

An initial consideration of the Lending Advisor project and its context raised a number of issues which were then used to inform and aid the research process. Part of this research process involved a continuing, iterative reflection upon the issues raised by the case study in the light of the literature reviewed in the previous chapter, and theoretical frameworks offered by the field of social theory. As will be discussed in the section on data analysis later in the chapter, at this stage these theories were used as sensitizing devices, which helped open the researcher’s horizon to other ways of perceiving issues, concepts and themes.

As the case study progressed, careful note was taken of the way in which those that participated in the research project expounded on certain issues. The researcher also used her own judgement, and growing knowledge about the context of the case study, to develop an understanding of issues. Although the research questions continued to evolve over time, they remained broadly focused on the intentions and expectations of the project stakeholders, and the effect of introducing computer-based decision support into middle management’s everyday work practices. Particular attention was paid to unintended consequences that emerged during the Lending Advisor project, and the effect of time on all the issues.

After careful consideration of the data from the first phase of fieldwork, a number of research questions were formulated. These were regarded as a mid-level abstraction
relative to the overall premise of the thesis, and the specific questions asked in research interviews. They helped organize the data during the three years of fieldwork, develop the focus of the thesis, and inform the emerging analytical themes. They were as follows:

1. How are the managers responding to the introduction of Lending Advisor into their everyday work practices?
2. What is the impact of Lending Advisor on everyday work practices?
3. How does the Lending Advisor affect decision-making processes?
4. What will UK Bank look like after these dramatic changes?

The next section considers the fieldwork research plan in more detail. It describes the methods and sources for data collection, giving careful consideration to the dynamic between the researcher and participants in the case study.
3.6 Detailed fieldwork research method

The primary method for gathering data was extensive in-depth interviews with project stakeholders. The field work also involved attending residential Lending Advisor training courses, observation of everyday work practices, a review of internal organizational documentation and trade press, and some informal contact with past and present UK Bank and Engine Inc. employees, who were the manufacturers of the Lending Advisor software package.

The fieldwork involved a total of one hundred and thirty-nine formal interviews (see table 3.1). Table 3.1 summarises details of these interviews, and gives an indication of the status of those interviewed; the years in which the interviews took place; and the number of formal interviews conducted with each participant. The table does not take account of informal, written or e-mail contact with the participants which occurred during the course of the case study. Although these were valuable, they cannot be quantified in such a formal manner. It should also be noted, that there were many changes in personnel during the three and a half year study, particularly among senior members of the Lending Advisor team, which made formal follow-up interviews problematic although some informal contact was sustained.

The interviews were conducted on-site at the interviewee’s premises either in the UK or the USA. They were semi-structured in nature and usually based on notes taken at the interview rather than a tape recording. The interviewees often considered the issues covered during interviews very sensitive with regard to career interests and in-house politics. Through experience note-taking was found to put the interviewee more at ease than tape recording. A set of basic interview questions were developed which covered a variety of issues (see table 3.2). These were tailored for different stakeholders, (the version in table 3.2 was used with Lending Advisor users), but the emphasis on expectations and perceived benefits remained the same for each interview.

One important consideration when conducting interview-based field work is that it relies heavily on the interviewee’s verbal communication skills. All of the interviews were conducted at middle management level or above, where Mintzberg (1973)
suggests that 60% of managers time is spent communicating verbally. The interviews confirmed that these were articulate individuals and, therefore, this was not considered a major constraint of the project’s research method. The advantage of the semi- or unstructured interview is that it allows the respondent to choose his or her own language and topics (Spender 1989).

Bank managers spend at least 50% of their time interviewing customers, listening to their business cases and asking relevant question, the research interviews reversed that dynamic. It was very important to put the interviewees at their ease. I found that thoughtful body language and quiet listening was the most effective way to create a reflective space. Preparation for this began well before the interview itself. I made sure that I was on time for the interview and dressed formally (skirted-suit, white shirt, briefcase, conference pad) in order to conform to the ‘front stage’ (Goffman 1956) image of bank culture. Before the interview began I would assure the interviewee that I was aware that they were busy and under pressure. I would tell them how much I appreciated them sparing me the time. To reinforce this appreciation, develop trust and ensure good relations for follow-up interviews, one eye would be surreptitiously kept on the time. I would interrupt the interview after one hour, apologise for intervening, then say I was conscious that time had expired and offer to leave.

After exchanging pleasantries about travelling, weather, the building or room I would give my business card to the interviewee. This had a number of subtle effects, firstly it conformed to a familiar business ritual, secondly it highlighted the Cambridge University crest and my credentials. I would emphasis that whilst my research project had been approved by their head office in London, I was there as an academic and received funding from an ‘independent’ research council. The allure of academia, and especially Cambridge University, all worked to legitimise the interaction and confirm the importance of our meeting.
<table>
<thead>
<tr>
<th>UK Bank Lending Advisor Team</th>
<th>Year interviewed</th>
<th>No. of interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director</td>
<td>1996</td>
<td>2</td>
</tr>
<tr>
<td>Director, Lending Advisor II</td>
<td>1996</td>
<td>1</td>
</tr>
<tr>
<td>Assistant director</td>
<td>1995</td>
<td>1</td>
</tr>
<tr>
<td>Assistant director</td>
<td>1996</td>
<td>1</td>
</tr>
<tr>
<td>Senior UK Bank software consultant</td>
<td>1994</td>
<td>1</td>
</tr>
<tr>
<td>Senior project manager</td>
<td>1995</td>
<td>1</td>
</tr>
<tr>
<td>Project manager: Policy and Lending</td>
<td>1991-1994</td>
<td>1</td>
</tr>
<tr>
<td>Experts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team members responsible for the development of: Peer Data; Credit Grading; Expert Users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK Bank IT Business Consultant</td>
<td>1994-1995</td>
<td>2</td>
</tr>
<tr>
<td>Knowledge Engineer</td>
<td>1994</td>
<td>1</td>
</tr>
<tr>
<td>EIS Team – Input Manager; Assistant</td>
<td>1994-1995</td>
<td>2</td>
</tr>
<tr>
<td>Members of the UK Bank IT dept.: (methodology; user interface; business analyst; prototyping; joint application development)</td>
<td>1994-1995</td>
<td>10</td>
</tr>
<tr>
<td>Lending Advisor trainers (during residential course)</td>
<td>1995</td>
<td>4</td>
</tr>
<tr>
<td>Manager trainees during residential course</td>
<td>1995</td>
<td>10</td>
</tr>
<tr>
<td>Local Application Managers (LAMs)</td>
<td>1994-1996</td>
<td>4</td>
</tr>
</tbody>
</table>

**UK Bank risk management**

<table>
<thead>
<tr>
<th>Role</th>
<th>Year interviewed</th>
<th>No. of interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional risk director</td>
<td>1995</td>
<td>1</td>
</tr>
<tr>
<td>Senior risk analyst</td>
<td>1995-1996</td>
<td>4</td>
</tr>
<tr>
<td>Junior risk analysts</td>
<td>1995-1996</td>
<td>2</td>
</tr>
<tr>
<td>Users/managers (comparative study of twenty)</td>
<td>1994-1997</td>
<td>50</td>
</tr>
<tr>
<td>Fast track graduate trainees</td>
<td>1995-1996</td>
<td>8</td>
</tr>
<tr>
<td>Managers retired before Lending Advisor</td>
<td>1993-1997</td>
<td>4</td>
</tr>
<tr>
<td>Managers retired after Lending Advisor</td>
<td>1994-1997</td>
<td>4</td>
</tr>
<tr>
<td>Spouses and family of current managers</td>
<td>1994-1997</td>
<td>8</td>
</tr>
<tr>
<td>Spouses and family of retired managers</td>
<td>1993-1997</td>
<td>4</td>
</tr>
</tbody>
</table>

**Engine Inc.**

<table>
<thead>
<tr>
<th>Role</th>
<th>Year interviewed</th>
<th>No. of interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventor of the Lending Advisor software package</td>
<td>1995</td>
<td>1</td>
</tr>
<tr>
<td>Vice president of Engine Inc.</td>
<td>1995</td>
<td>1</td>
</tr>
<tr>
<td>Member of the Engine Inc. executive board</td>
<td>1995</td>
<td>1</td>
</tr>
<tr>
<td>Engine Inc. Syntel programmers</td>
<td>1995</td>
<td>2</td>
</tr>
<tr>
<td>Past Engine Inc. consultant</td>
<td>1995</td>
<td>1</td>
</tr>
<tr>
<td>Present Engine Inc. consultant</td>
<td>1995</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table 3.1. Summary of interviews conducted**
Further 'back stage' (Goffman 1956) preparation involved ensuring that I was aware of culturally specific language and terminology. I took care to use terms correctly (as far as possible for a non-banker) and to let the interviewee know that I had interviewed other stakeholders throughout the organizational hierarchy and beyond including the inventor of the system in the USA. If the interviewee knew any of the stakeholders that I had interviewed, thoughtful comments or humour that indicated that I knew that person tended to contribute to a process of 'bonding' during the interview.

One of the first stakeholders that I interviewed, a software consultant, suggested that I should develop a profile of the users that I interviewed, for example how many years they had worked in UK Bank, their background and education, what their position in the bank was, a description of their career trajectory and so on. Developing this seemingly neutral historical profile proved to be an effective way to begin the interviews.

The interviewee tended to put the introduction and use of Lending Advisor into context. For example, they might reflect upon the changes that were happening around them, the effect that this might have on their career progression; their strengths and weaknesses as managers in the past; and how they fitted into the new environment. Whenever the interview needed a little 'steering', I would try to slip in the semi-structured questions (see table 3.2) in as unobtrusive a way as possible without interrupting the interviewee's 'flow'. Or, if they started to get self-conscious or embarrassed or uncomfortable by something they had revealed about themselves or by the length of time that they had been in monologue, I would use the questions as a way of breaking off one line of interview and going off on another. This change in focus often served to put them at their ease. Apart from the these deliberate changes in emphasis, the interviewee was allowed to lead the direction of the interview.

Through 'active' listening and use of body language, I tried to make sure that the interviewee knew that I was interested in their experiences and considered them unique. I encouraged them to talk about themselves, their everyday work practices, and the things that were important to them, whether that be career, family, success
stories or justifications of failures, and these narratives usually flowed quite freely. Like most working people, many of the interviewees had little time to reflect upon their environment or work practices. On the whole they experience so little consideration of their personal priorities and so little effort is made to understand their everyday lives, that they appeared to bask in the attention.

| 1. | What was your first introduction to Lending Advisor? |
| 2. | How long have you used Lending Advisor? |
| 3. | As you understand it, what are the goals of Lending Advisor? |
| 4. | How do you feel these goals are being achieved? |
| 5. | How did you find the Lending Advisor training? |
| 6. | Which screens do you use most often/least often? |
| 7. | Are there any aspects of the hardware/software that you would change? |
| 8. | What proportion of the Lending Advisor assessments correspond to the decision that you would have made without the Lending Advisor? |
| 9. | Does it provide skills and access to information that you find useful? |
| 10. | What is the quality of its contribution to the lending process? |
| 11. | How much of your time do you estimate Lending Advisor has taken up during its implementation? |
| 12. | How much of your time do you estimate Lending Advisor takes up on an everyday basis? |
| 13. | Has Lending Advisor changed the nature of your job in a positive way or in a negative way? |
| 14. | How do you see the job of manager changing in the future? |

Table 3.2 Basic interview questions

Of course, every interview was different and the above does not adequately convey the unique character of each interaction. These details are designed to give the reader a ‘peephole’ view of the interview process; they do not represent a prescription used at every interview, but are retrospective insights on a dynamic research process. Interviewing is a highly situated and spontaneous process which demands the ability to adapt responsively from moment to moment.
The bedrock of the empirical work was a comparative study across two contrasting regions within UK Bank: London Central and Cambridge. The candidates for interview were selected by the Lending Advisor implementation managers (LAMs) from within those regions, and based upon a request from the researcher and the Lending Advisor project manager for a broad range of experience, ability and attitude. Twenty Lending Advisor users were interviewed in the two regions at the regional offices, UK Bank business centres, and in local branches. Their progress with Lending Advisor was followed over a period of eighteen months through a series of follow-up interviews.

In the first round of interviews, most of the Lending Advisor users/managers appeared both stressed and keen to discuss their experiences. Although the interviewer made a particular point to honour the one-hour appointment that had been arranged, all the managers indicated that they would prefer to continue the 'discussion'. The managers emphasised to the interviewer that they found the interview process both helpful and interesting. The shortest first round interview was, therefore, 105 minutes and the longest 245 mins. At the end of the interview, the users/managers all extended enthusiastic invitations to return and follow-up the interview. Although concerns varied between individuals, some themes were common to all the interviews, and these informed the research analysis.

Some care has been taken to detail the terms of engagement here and the interviewer-interviewee dynamic. This is an area that is seldom mentioned in the literature, yet it is felt to be of considerable importance as it may effect the attitude that the reader takes to the case material and indeed the outcome of research in general. Two events inspired this reflection. The first was, the realisation that the 'analyst' in the article by Boland and Day (1989), reviewed in the previous chapter, was in fact not a female research participant, but a male action researcher - Day. The field work data appeared to have been gathered by academic researchers through a series of interviews with a practitioner. Instead, the data were gathered through action research and the identity, including the gender, of the researcher subsequently disguised. As mentioned above,
these two methods of research are, of course, very different dynamics and influence the way in which the material is read.

The second cause of reflection was that a few of the second round of interviews that were undertaken for this research were conducted with the researcher's Ph.D. supervisor, Professor Geoffrey Walsham. It was found that the presence of a different sex interviewer with higher status would subtly change the way that the interviewees narrated their experiences. This realisation was, of course, very interesting from a hermeneutic perspective and encouraged the researcher to consider in more depth the influence of social and power relations on the way in which an individual interprets and narrates their experience. This is not an aspect of field work research that is frequently commented on in doctoral theses, partly perhaps because it forces some transparency about the power relations between the doctoral student and their supervisor. However, since it did emerge as a consideration during data gathering, and was discussed in detail with Geoff, the reader may be made privy to these methodological reflections.

Geoff's presence, and the shift in narrative that it tended to produce, had both positive and negative implications for the research process. Since he was not as immersed in the case study process as I was, he inevitably didn't give the same kind of attention to cultural detail, for example: he didn't wear the dark suits and white shirts; didn't know as much culturally specific language; and had to trade off his own time pressure versus the interviewee's priorities (we were sometimes late arriving at the interview site). Geoff's 'front stage' (Goffman 1956) persona was very much the Cambridge academic and this 'otherness' contrasted with my strategy of 'chameleon ethnographer'. His presence lent a legitimacy to the event which made interviewees take the interview process more seriously. However, in a few cases, interviewees indicated that they thought that I was being 'examined' and tried to make me 'look good' or to 'back me up' in the interview in an almost conspiratorial way. The majority tended to sustain eye contact with Geoff rather than myself during the interview.
The interviews conducted with Geoff tended to be more unstructured, since with three people in the interview I did not have as much opportunity to ‘steer’ the discussion with my own questions (see table 3.2). Further, whereas I would tend to let the interviewee do most of the talking, Geoff would offer his own views, perhaps taking a historical view of a topic based on his many years of experience in IS research. Since Geoff had conducted field research in other countries and in other sectors, he could reflect on how issues had changed, or how transformations in the nature of work in other sectors related to banking. The interviewees usually found this interesting, but I was conscious that it resembled their ‘normal’ work dynamic where they listened and assessed the value of the person talking.

On the more positive side, I was presented with an opportunity to hear Geoff challenge the views of the interviewees and raise issues with them, which I tended not to do. I had more time to reflect and make notes which was otherwise challenging when trying to manage the interaction on my own. Although I did feel that I lost control of the situation at some points, I always left these joint interviews feeling that I had achieved my research objectives. When I went back again to visit a manager that had been interviewed by Geoff and I, they would always say how impressed they were with him and comment on the interesting points that he had made. From comments that the interviewees made, it appeared that Geoff had become fuel for their dinner party/pub conversations and reflections. In an example of the inevitable double hermeneutic ‘slippage’ between the worlds of interviewer and interviewee, some of the subsequent narratives would be partially contextualised within Geoff’s language.

I balanced out my concern about the different dynamic and data with the valuable input that Geoff was able to give me as a result of his increased familiarity with the case study. On a more controversial note, but in acknowledgement of the pervasive nature of societal power relations, I was conscious that this was one way that a supervisor maintained an awareness of industry field data for his or her own research. Many Ph.D. students experience a trade off between supervision and revision of their research by the academic that they work with in an institution. The ethics of this process are a major grey area in academic life and most doctoral students recognise
that they are required to 'pay their due' by allowing their data to form the basis of publications by their supervisor in return for supervision. The more fortunate Ph.D. students feel that working with a supervisor enriches their own research process. The balance between exploitation and mutual benefit needs to be maintained by both parties, voicing concerns if they have them and regularly negotiating these sensitive boundaries. This was certainly how the supervisor/student dynamic was managed during this Ph.D. research.

The most significant point about these joint interviews was that the interviewees tended to tell less anecdotes about their family or personal life, and put more emphasis on their expertise and business processes. Female colleagues have asked me if I was disappointed not to have had more of this business focus in the interviews that I conducted on my own. My answer to this is two-fold. Firstly, whilst I have emphasised these subtle differences in interview content for the purposes of this methodological 'confessional', they were subtle and did not significantly undermine the research process. My case study is testimony to the extensive data that I gathered on business process and expertise. Secondly, my hermeneutically informed approach meant that I was not just interested in the techniques that these individual's used in their everyday work practices, I was researching how they made sense of Lending Advisor. How did these managers come to understand and experience Lending Advisor in the context of their lives? My research data reached beyond an isolated cognitive theory of decisions involving risk to ask how managers interpreted this transformation in the interpretation of risk within a situated, cultural and holistic hermeneutic. I had the opportunity to witness a group of LA managers/users define and redefine their self-identity and work processes as an organisational context which was transforming around them.

No formal presentations or recommendations for strategic changes occurred during this phase of data collection. However, what could best be described as a 'working relationship' developed with the twenty regional Lending Advisor users in the comparative study, and a decision was taken to allow the final round of interviews to become a 'two way street'. Feedback based on the research may, therefore, have been communicated at this point to the interviewees. As the research project progresses, a
degree of involvement is inevitable, if one accepts that the researcher cannot be 'bracketed' in the fieldwork process. As previously discussed, Giddens' (1984) refers to this as the 'double hermeneutic' which he describes as the 'constant slippage from one to the other' involved in empirical work.

The decision to give limited feedback to the interviewees was also based on a sense of ethical obligation for the time that these individuals had given to the research process, and a respect for the considerable stress and pressure that they were experiencing. A further ethical consideration was the use of real names in the case study. The issue of secrecy in information systems research has been an issue for debate among the European information systems research community, for example, Walsham (1996). Interpretive research methods emphasise the importance of context and it could well be argued that the name of the organization would contribute significantly to an understanding of the case study. However, the development of Lending Advisor was a commercially sensitive project, and access was extended to the researcher on the basis of discretion. Although it is accepted that those with a good knowledge of the field might be able to follow references and identify the organization in the case study, many others may not be able to do so. This is a critical study of computer-based information systems within an organization, and it was felt that the repetition of the organization's name in this context might lead to a negative association in the minds of the less well informed.

A further undertaking was given to protect the identity of the individual's who were interviewed, and this will be honoured. The interviewees spoke candidly about their experiences and, whilst some of them asserted that they would like to be associated with their comments, others were extremely wary. It was felt that if the principle of secrecy was to be applied to some in the case study, it should be applied to all.

There are inevitably trials and tribulations involved in any longitudinal fieldwork. A doctoral student who chooses to undertake fieldwork as an 'independent' academic is highly dependent upon the good will of participants at the field sites. If the research participants experience work pressures, the doctoral student is shifted to a low priority. I was conscious that the interviews being conducted were time critical and
had noticed how the interviewee’s narrative was temporally contingent. It was, therefore, frustrating when requests for interviews were buried by participants or were rescheduled multiple times. Whilst on the one hand it is important not to disaffect the interviewees by nagging, there are also times when it is necessary to ‘jog’ their memories. In retrospect, I may have been too cautious of my status and overly reticent about ‘chasing’ an interview. Patience is a necessary attribute for any field researcher, particularly those conducting longitudinal studies where the time to publication and dissemination is so long. An extensive field study of this nature requires a considerable commitment of time and resources.

Another aspect that one must be wary of with field work is the phenomena of ‘ethnographic dazzle’ (Woolgar 1988). After conducting twenty or more interviews with a ‘research group’ (for example the bank managers in this study), using the same questions, there is a danger that one begins to anticipate the answers from interviewees. At this point it is best to reconsider the timetable of interviews (for example not scheduling too many on the same day), or revise the number of interviewees in each ‘research group’. It is important that one has the capacity to ‘hear’ the responses from the interviewees, rather than patch together one’s own prejudices within a loose narrative. One of the most challenging and difficult aspect of the fieldwork was living with the anxiety that, as Van Maanen (1982) reminds us, one could spend years in the field and still not produce any analysis of value to the wider academic community. When the field work was still ‘in process’, I was asked to give several presentations in which colleagues commented on the story-telling nature of interpretive research and demanded to know what my analysis was going to be. Whilst uncomfortable at the time, this constant menace produced a ‘creative pressure’ that pushed the researcher to form an analysis. The next section will consider this in more detail.

3.7 How the data were analysed

The final section of this chapter discusses the nature of the claims made in this study. The use of rhetoric and generalisation as a medium for presenting research findings in interpretive research is examined in order to understand the status of those claims. Evans-Pritchard’s (1951) three-phase ethnographic method is then presented in further
detail in order to help the reader to understand how the field data were analysed and shaped into a thesis. The multi-level analysis is then introduced and briefly described.

3.7.1 **The status of the claims made in this research**

The findings in this research are in the form of general notions, or propositions, obtained by inference from the three-year Lending Advisor case study. The aim is to present a convincing analysis which will inform and inspire other research. In order to establish the status of such findings, their nature needs to be explored further.

Perhaps conditioned by the environment in which many of them present their work, one finds that interpretive researchers can sometimes verge on the apologetic with regard to the nature and status of findings in their research. Like a soufflé rising in the heat of the interpretive intellectual 'trend', when they meet with a cold reception, they collapse, rather than substantiating their claims with further intellectual rigour. This is, firstly, because they are usually trying to compete with work of a very different epistemological tradition, and secondly, because the status and nature of generalisations needs careful elaboration, as it is a term frequently used in day-to-day colloquial use to imply that something is inadequate in research.

Generalisation based on a researcher's own interpretation of field data is ‘both the strength and the weakness of qualitative research’ (Van Maanen, Dabbes et al. 1982). This kind of analysis depends on the art of persuasion, rather than hypotheses with samples that can be tested. More traditional, 'scientifically' inclined colleagues profess to feeling uncomfortable at the thought of acquiescing to the interpretive researcher’s findings on the strength of their rhetoric alone. Where is the ‘proof’? How can they 'check' for themselves?

Positivist samples require a representative quantity and type of data that others can validate. The interpretive approach is radically different. It simply requires sufficient data for a rationality to emerge (Spender 1989). ‘The notion of a statistically valid sample is quite meaningless in an interpretive programme. The kind of validity that
[the interpretivist] demands is that which makes data itself meaningful' (Spender 1989).

The generalisations in this research are all based on one case study, and therefore may be subject to the potential criticism that they are context-bound. The counter to this is threefold. Firstly, this research is offered as a response to the recent call from Smithson, Baskerville, and Ngwenyama (1994) for more empirical work, in order to better understand computer-based information systems and their role in organizational transformation. Both the empirical work and findings therefore represent a contribution to the cumulative research approach underway in information systems, which aims to develop a range of case studies for the 'consultable record'. Secondly, the research extensively references diverse literature and draws on other case material from a broadly interpretive tradition in order to generate interesting insights of general applicability to other situations.

Interpretive research is based upon different epistemological assumptions and in this tradition: 'Generalisability from small numbers of case studies relies on the plausibility and cogency of the inductive reasoning from them, rather than being based on statistical inference from a representative sample as is the case for many positivist research designs' (Walsham 1993).

Still, further elaboration is needed in order to understand the different kinds of generalisation from interpretive case studies. Walsham (1995) suggests four different types: the development of concepts, for example Zuboff's 'informate' (1988); the generation of theory, for example Orlikowski & Robey (1991) and Jones & Nandhakumar (1993); the drawing of specific implications (Waema and Walsham 1990); and the contribution of rich insight (for example, Suchman (1987)). As will be seen in later analysis chapters, the findings from this research will contribute insights relating to the formulation of strategy in practice; specific implications concerning the management and use of computer-based decision support systems, like Lending Advisor; and concepts intended to further the usefulness of hermeneutics in information systems research.
Walsham's last category of generalisation, the 'rich insight', needs a little more comment. The term 'rich' is a word often evoked by empiricists who feel the value of their fieldwork and are anxious to communicate it. However, it is a vague phrase that leaves much to the imagination and contributes little to our understanding of the nature of interpretive research. The insights that are generated from interpretive research all have a different 'richness', for example: personal empathy; industrial knowledge; or strategic thinking. It is hoped that this study will be able to illustrate some of these different insights in due course.

Van Maanen (1989) characterises these kinds of findings at their best as 'a coherent point of view told with grace, wit and felicity'. This strong emphasis on the art of persuasion has left interpretive studies vulnerable to the charge of being novel-like or high-level journalism. They are actually substantially different from the latter, because of the extensive effort to make the findings and views informed ones.

The aim of this research study is not to say that the account given in the case study is what 'really happened' in the Lending Advisor project; it is to make an informed interpretation and analysis of the events available, as Geertz (1973) says, for the 'consultable record'. Van Maanen (1979) reminds us that in organizational ethnography we should regard the interviewee's constructions as first-order data and the construction of the researcher as second-order concepts. Although the field material is indeed our 'primary source' Geertz's (1973) point is well made that, 'What we call our data are really our own constructions of other people's constructions of what they and their compatriots are up to'.

Constructing a case study from fieldwork data begins as soon as one has chosen a case site, begun compiling in-house or industry documents and started the interview process. As has already been noted, I developed my listening skills and they became an important part of my interview method. This gave me the opportunity to take careful notes and silently reflect upon the responses from the interviewee during the interview itself. I found that it was imperative that these notes were written up as soon as possible after the interview, so that the interview transcript would contain not just interviewee's responses, but also my reflections and cumulative process about the
case study. To this end I would carry a dictaphone with me and usually dictate the
notes on the train or car as I went back to Cambridge.

At the end of each transcript I would include a section of general comments. These
would include a description of the interviewee's body language; their general attitude
towards both myself and the interview process; and notes of interest regarding items
that they mentioned were forthcoming in their life (for example a major account
review or a new baby); and anything else that I felt would impress them if I mentioned
it in the next round of interviews. Being able to begin the next interview with
questions regarding matters that were important to each individual helped to convince
the interviewees of my genuine interest and attention.

After the interview notes were transcribed, I would comb out of the data landmark
events and calendar dates which would be put on a separate sheet to help me get an
overview of the project. If any points of vocabulary or culturally specific knowledge
was demanded in order to interpret the field data, I was fortunate enough to have my
father to provide insight. When major themes or issues (particularly contradictions)
emerged, I would raise them with my supervisor and discuss how they related to the
overall analysis in our next supervision meeting. Apart from this valuable verbal de-
briefing and reflection, I sometimes also pursued a theme a in piece of written work or
presentation that was due around that time. The process of writing itself imposed a
certain ruthless clarity, exposing bones where I had thought there would be flesh, or
causing me to experience 'chronigami moments' (Kavanagh & Araujo 1995), where I
suddenly saw connections and processes emerge from formerly separate events.

I considered subjecting the field data to content analysis using Nudist software, but
felt firstly (and most importantly) that through walking, talking and dreaming the data
I had more than enough material to working with. Secondly, transcribing the 139
interviews was a long process, coding the transcripts would have taken even longer
and time was at a premium. However, I would have had no epistemological problem
with a Nudists analysis and would have treated it like any other interpretation, with its
own unique bias. In the end I felt the organic analysis that arose out of my own
longitudinal immersion with the data and hermeneutic process embraced themes, issues and concepts that made an interesting contribution to the IS field.

I found that the most effective way of developing an account of the case was to sit and read the interview notes over and over. Through this iterative process some quotes gradually clustered around certain themes and, by being very aware of the chronology of the interviews, a logical flow emerged and I began to sense the way in which Lending Advisor was being translated by power interests within UK Bank. Identifying contradictions, within a single interview, and/or with the same interviewee at different interviews and/or between different stakeholders was a very important aspect of this process. It tended to highlight the relative strengths and weaknesses in a web of interested actors associated with Lending Advisor. For example, the ardent rhetoric by the LA project team and local application managers insisting that local bank managers were the ‘backbone’ of the risk management process versus the centralisation and clustering of branches and abolition of the title ‘local branch manager’ in favour of ‘corporate manager’.

Over time, I began to realise that when a person forms a narrative, that narrative reflects a ‘situated’ and reflexive epistemology, or choice about what constitutes valid knowledge. I began to listen for the actors that would be ‘scoped out’ of narratives and, in turn, who emerged as important or ‘key’ to the story. It was perhaps my background and interest in both gender issues and so-called ‘developing countries’, (areas which so often contain ‘silent voices’) that sensitised me to this process. However, if I became aware that a narrative in an interview conflicted with that of other stakeholders, I did not show the interviewee that I knew this as I felt that it might unduly influence them. Indeed, I was very careful not to break confidences, even when put under pressure to do so. If I disagreed with an interviewee, I might ask a ‘follow-up’ question to try to understand the point being made, but beyond that I tried to ensure that I did not emanate judgement or make my negative reaction obvious. When I transcribed the interview I would note my reflections upon the interviewee’s response. If the interviewee’s comments highlighted an important issue or shift in the project, it became fodder for my analysis; if not, it was recorded for possible future use.
Interpretive research is sympathetic to a 'kaleidoscopic' version of the social world; however, it does not necessarily follow from this that every interpretive researcher endorses a totally relativistic view, where any interpretation is as valuable as the next. Firstly, interpretive research findings are judged by the academic community by the degree to which they offer informed views, propositions and notions which are subsequently useful to other researchers. Secondly, post-modern relativism disables our ability to respond to situations that we find ethically challenging (Walsham 1993; Beck 1992). The stance taken in this thesis is that one cannot accept all interpretations as equal since embedded in every ‘story’ is an ‘epistemological order’ which reflects important power relations. The responses gathered from interviewees are neither neutral nor passive. As a consequence, some interpretations have potentially different effects on the world since they may translate into actions that which one may find hard to accept depending on one’s ethical perspective. For example, if a person confides in you that they intend to reject capitalist values for a life in a peaceful commune, versus another who confides that they are a neo-nazi with an arsenal of arms and intend to annihilate immigrants in their neighbourhood.

In the case of Lending Advisor, the researcher was present during a historic period of transformation in the nature of work brought about by powerful corporate interests, which could have broad implications both for the local ecology of the financial services and for our globalising society. Lending Advisor began as a functional initiative with a limited project mandate. According to the narrative presented in this dissertation, LA was subsequently ‘hijacked’ by power interests within UK Bank who saw it as an opportunity to develop a program of organisational change which could be implemented in the wake of Lending Advisor.

This thesis puts considerable emphasis on the emergence of new forms of risk in the lives of Lending Advisor users/managers and the profound insecurity that was experienced as a consequence of this program of change. This insecurity emerged from a sense of shifting priorities within UK Bank’s corporate skill set and persistent ambiguity regarding the value currently being attributed to the manager’s local knowledge versus the ‘scientific’ knowledge mediated by Lending Advisor. An
'epistemological re-ordering' of this kind implies a significant shift in power relations within an organisation and this has ethical implications as inevitably some actors will find themselves politically disenfranchised. The contradictions between rhetoric and actions that emerged as UK Bank, a traditional, mature organisation, underwent a transformation highlighted these changing power dynamics and the intelligence behind the political 'reality shaping' (Walsham 1993) being carried out by agents of change.

Finally, Van Maanen (1979) warns that undertaking an ethnographic study does not guarantee that the researcher will collect useful data no matter how long they stay in the field. Participants may, knowingly or unknowingly, deceive the researcher for many reasons or the participants may themselves be misled. Indeed, as will be argued in the next section, just collecting the data and telling a series of good anecdotes may be interesting, but it is not enough. Interpretive researchers also need to communicate the fieldwork using an appropriate theoretical framework (Orlikowski and Robey 1991) and insightful analysis. The next part of this section goes on to discuss how this was done in the thesis.

3.7.2 Data analysis in information systems research

As discussed above, interpretive research methods generate informed descriptions and generalisations which help us to understand a phenomenon better. Description and anecdote can be useful tools for learning but, as absorbing as they may be for the interpretive field researcher, they do not suffice as a form of analysis. Bhaskar (1979) says that when we analyse data we are looking for 'tendencies' that have emerged in the course of the research which explain past data. These are then put into logical clusters and communicated in the form of issues, themes and concepts held within a coherent analytical context that is, hopefully, of value to other researchers. The aim of this process is to better understand a phenomenon, not predict the future (Bhaskar 1979).

An example of this process of logical clustering might give the reader a better sense of how the thesis found its shape from the mass of research data. One of the most important issues that came up over and over in the research interviews with LA
managers/users was a profound sense of job insecurity. The managers talked about the past, present and future, reassessing their skills and re-inventing themselves in the new Lending Advisor context. It, therefore became apparent that job insecurity and manager’s perceived risk to their career trajectory might form the basis of a major theme in the thesis.

The next challenge was to understand the nature of this insecurity and to note how it evolved over time. For example, during the first round of interviews with the group of twenty bank managers, the majority focused their anxiety on their ability to adapt their work practices to the new Lending Advisor computer technology. In the second round of interviews, most managers felt that they had adequately adapted to the new computer-mediated work processes; however, a program of redundancies that followed, as a consequence of the downsizing and ‘de-layering’ enabled by the Lending Advisor technology, followed in its wake and generated a new dimension of job insecurity.

The re-ordering of the epistemological basis of decision-making involving credit risk, and restructuring of the branch network, systematically undermined the traditional bank manager’s previous power-base, including many sources from which he tended to construct his identity in the world. Relating this to an interpretive ‘stock of knowledge’ (Walsham 1993) about Gadamer’s work, one begins to form a thesis emphasising a ‘situated’ hermeneutic process which embraces the users'/managers' perception of risk in their human ecology and its potential influence on their dynamic with Lending Advisor. The role of social theory in shaping a thesis will be discussed next.

Certain social theories can be useful sensitising devices in the early stages of research, helping to focus attention on certain aspects of the case study, and later it provides a useful context for thinking about findings. Information systems researchers, particularly those who employ an interpretive research method, would benefit from developing and articulating the theoretical context of their analysis. Not only does this have considerable potential for subsequently communicating an analysis of those
findings, as mentioned above, it also helps distinguish their work from others in the field and contributes refreshing, new perspectives.

This research was not concerned with 'proving' any of the social theories that it drew upon, or using them in a mechanistic way. It should be noted that the thesis deliberately changes the focus on social theory from foreground to background. This has important implications for the multi-level analysis which is discussed in the next sub-section. Some of the social theories, like Gadamer's hermeneutics, are used to inform the assumptions behind the study, others (for example Beck 1992) provide a context for communicating a particular analysis of the Lending Advisor case. The aim was not to try to generate an 'meta-theory' from an eclectic of theories, but to construct a context for the reader to think about the study and its analysis using theories whose philosophical underpinnings were broadly sympathetic. This study rejects the possibility of a 'complete theory'; each theory was recognised as necessarily partial, and used in whatever way was felt to be its strongest and most useful application to the research, in full acknowledgment that all these theories had their critiques. The following attempts to provide the reader with a sense of how the logical clusters described above were related to social theories in order to generate a sociological analysis for dissemination among the academic community.

We have already noted that Gadamer's (1975) primary contribution to the research approach here was to emphasis understanding a phenomena rather than measuring it. Gadamer is interested in the nature of knowledge and understanding which is, of necessity, a key theme in this research study where computer-based decision support systems were introduced to a greenfield site. As described above a logical cluster of data regarding perceived risks to Lending Advisor users'/managers' careers, and the insecurity that it generated for them, was related to concepts derived from Gadamer's (1975) hermeneutics.

There are three major aspects of Gadamer's (1975) thesis that provided useful concepts for the formation of this thesis. When a human agent encounters a phenomenon they go through a process of appropriation whereby they construct an interpretation of it based upon their own past experience, perception of the present and
projection of the future. 'Data' is 'inwardly formed' (Boland 1987) and given meaning by human agents out of their pre-learning or prejudice to become 'information'. Gadamer (1975) argues that we need to defend and investigate further the understanding that emerges through lived experience. For Gadamer, the way one experiences art or history is very different from theories of art or documented history that lets themselves be restricted to a scientific concept of truth.

In the majority of the decision support systems literature, decision-making takes place in a vacuum. Further, the theoretical models of risk that were embedded within the Lending Advisor system are idealised and decontextualised. Just as theories of art or documented history are so distant from the our experience of art or history, so theories of risk and decision-making are distant from the experience of risk. Gadamer's hermeneutics provided a context in which our attention was shifted from techniques of decision-making and risk management to the totality of the Lending Advisor users' lived hermeneutic experience. Thus a thesis concerned with situated decision-making and perceptions of risk in the human ecology emerged which led to an attempt to further Beck's (1992) vision of the Risk Society.

It is acknowledged that this thesis is my own interpretation of this phenomena and will inevitably not be shared by all others. A critical audience will decide whether or not it is an informed interpretation (and in so doing they will reflect social and power networks). It is further acknowledged that this thesis would not conform, or be generally recognised as, a traditional 'scientific' methodology. Rather its aim is to 'reinforce an insight that is threatened with oblivion in our swiftly changing age' (Gadamer 1975) by investigating how our understanding is influenced by our lived, situated hermeneutic.

Describing precisely how an analysis of data is constructed from such social theories is challenging. My understanding and interpretation were 'not constructions based upon principles, but the furthering of an event that goes far back' (Gadamer 1975). Whilst one can in some sense present a 'reverse engineered' narrative about how one develops an analysis from field data for the purposes of a methodology chapter, in practice the process is not so neat and tidy. It may be useful for the reader to gain a
sense of the status and role played by social theory in information systems research, however imposing a formality upon this cumulative, and sometimes intuitive, process may also reflect traditional epistemological demands. As Gadamer (1975) notes:

'We have lost the naïve innocence with which traditional concepts were made to serve one’s own thinking. Since that time, the attitude of science towards these concepts has become strangely detached, whether it takes them up in a scholarly, not to say self-consciously archaizing way, or treats them as tools. Neither of these truly satisfies the hermeneutic experience.'

Social theories do not all focus on the same 'level' of intellectual investigation. For example, the social construction of technology (Bijker, Hughes & Pinch 1987) helped guide and focus the research at a 'micro' methodological level. One of its fundamental tenets is a rejection of technological determinism and an assertion that there is no one inevitable way to develop technological artifacts. Therefore, when interviewing, one is listening for narratives about why things emerged in the way that they did, rather than take another, different direction. Once again, one is not interested here in 'triangulating' to find the 'correct' interpretation, but in collecting multiple interpretations with all their contradictions.

It was also felt to be important to have a way of understanding the role of computer-based information systems within the social and political context of an organization. Bruno Latour's (1987) work developed from the early debates on the social construction of technology. His concept of actor-networks is a helpful way of enabling a 'mid-level' abstraction of information systems, which provides insights into how computer-based information systems are mobilised as a resource within the organization and how they are drawn upon symbolically by other 'actors'. This was especially helpful in Chapter Five, which considers the strategic role of Lending Advisor in the context of UK Bank.

Finally, the projective sociological work of Ulrich Beck (1992) provided an opportunity to understand the way in which computer-based information systems may be contributing to the emerging process of globalisation. His notion of the de-
standardisation of labour was a powerful one; however, despite identifying computer-based technologies as being a major influence shaping society, they are not his central research interest. It was felt that the Lending Advisor study could both explore and extend Beck's work on the role of technology and risk in society.

Having described how social theories may provide an analytical context that may inform the development of a thesis, we will now briefly discuss the way that the resulting analysis may be presented.
3.7.3 A multi-level presentation of the analysis
The decision to adopt a multi-level presentation of the thesis (figure 3.2) emerged from the growing awareness that it made contributions which had important implications for an interconnected community: UK Bank, the UK banking sector and those experiencing the emergence of a risk society. It was, therefore, felt that different levels of interpretation, each valuable in their own way, could be made with the data. Further, the production of similar, but qualitatively distinct, interpretations was in harmony with the hermeneutic perspective adopted in this study.

Figure 3.2 Multi-level analysis: the relationship between chapters in Part Three
The three phase, Evans-Pritchard (1951) ethnographic model, briefly described in the methodology section above, had significant influence on the way in which the data analysis was presented. It guided the formation of a thesis, inspiring the researcher to take a critical step away from the field data, which is very challenging in longitudinal studies. It is described here in some detail since it played an important part in the
shift from immersion in field data to formation of the thesis, although it had a very different status from that of the social theories previously discussed which explicitly form part of the analysis in the thesis. The Evans-Pritchard concept contributed to an experience that was more akin to spending time in a ‘decompression chamber’ after deep immersion. Intellectually it guided me through a series of adjustments in my relationship to the data and contributed to the development of a multi-level presentation.

The first phase of the Evans-Pritchard model emphasises the importance of spending time in the culture under study: learning about the culture being studied, the language they speak, understanding their concepts and feeling their values. In the second phase, the researcher must ‘live the experience over again critically’. During this phase she interprets the experience in terms of the general body of knowledge of her discipline. In other words, she ‘translates from one culture to another’ trying to go beyond the impressionistic stage ‘so that it is intelligible not merely at the level of consciousness and action, as it is to one of its members or to the foreigner who has learnt its mores and participates in its life, but also at the level of sociological analysis’ (Evans-Pritchard 1951). In the final phase of her work the researcher compares her analysis with others and identifies the contribution of the research.

This way of conceptualising the research process was of particular value during the analysis process. Evans-Pritchard's first phase encouraged and supported the researcher in her efforts to understand the culture and context of UK Bank, including their language, concepts and values. During the case study the researcher was able to talk easily to members of UK Bank or the banking profession about the implications of the study. Indeed, some interviewees commented on her use of culturally specific language and asked if she had worked as a bank manager. Academic audiences commented on her ability to describe in rich detail anecdotes and experiences from the fieldwork.

A first level analysis inevitably occurs during the course of the case study itself, but Evans-Pritchard's model was a potent reminder that this was not sufficient; a further critical transition is required from all empiricists if they are to make a contribution to
the wider academic community. It was not until the case study experience was related to further, extensive reading in the information systems literature and beyond, that any kind of second phase 'translation' took place. Finally, although one is conscious of the potential contributions that a thesis may make during this second analysis phase, confirmation must wait until the third phase of Evans-Pritchard's model if, and when, others read published work based on the Lending Advisor study and find it offers insights that informs their own work.

By presenting the thesis in a multi-level model, the study contributes to the two different communities that constitute the computer-based information systems field. Information systems is an applied academic pursuit. The issues that concern computer-based developers and practitioners, although related through a shared context, need to be framed in a different way than more abstract academic themes. It is important, and ethically appropriate, to make research findings accessible at this local level of analysis if one conducts longitudinal case studies. There is a legitimate concern within organizations that if they give of their time and resources, they should receive some kind of feedback.

By contributing a local analysis the thesis was also acknowledging the importance of context in this study and to all interpretive approaches. Chapter Five, *Lending Advisor in UK Bank: strategy formulation in practice*, is presented as an analysis of the changing role of Lending Advisor within UK Bank. The chapter aims to contribute to an understanding of how the Lending Advisor project was translated by different power interests within UK Bank.

The aim of the first analysis chapter is, therefore, to focus on the contribution that the Lending Advisor study held for those who remain within the context of the case study. Although social theories informed the analysis presented in Chapter Five, they are deliberately kept in the background. Chapter Five considers the consequences of using a *specific kind* of computer-based decision support system in a *particular* organization. It considers Lending Advisor in the context of UK Bank corporate strategy and raises issues for management and use which are pursued in Chapter Six.
Whilst these issues are directly relevant to the specific UK Bank environment, it is believed that they also have a wider relevance to IS practitioners and researchers.

Finally, to quote Orlikowski, Walsham and Jones (1996): 'It is widely accepted that work and work-life in the industrialized societies of the late Twentieth Century are undergoing a profound transformation in terms of aspects such as the nature of work and job security at the personal level, changes in practice and instability of structures at the organizational level, and increasing interconnection and globalisation at the national and international levels. Information technologies are deeply implicated in these transformations'. It is therefore important, whilst acknowledging the interconnectedness of the different levels of analyses, to consider the implications of computer-based information systems beyond their local context, in an effort to understand the changes in the world around us.

The aim of the third level of analysis in Chapter Seven, therefore, is to consider computer-based information systems like Lending Advisor in the global context of a 'risk culture'. We examine how computer-based information systems enable the creation of new forms of action and interaction in the social world. The characteristics and life conditions that are emerging within organizations in modernising society are explored. The risk assessment techniques embedded in Lending Advisor are considered within the totality of the decision-makers’ hermeneutic experience and emphasis is given to situated, specialist lay knowledge. This provides an opportunity to reflect upon the transformation and generalisation of risk, and will draw upon definitions of risk beyond the financial model. It is suggested that the dynamic between local and global risk is a concern of profound political significance in our globalising society.
Part Two: The Lending Advisor case study

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Figure 4.0  Summary of Part Two
Chapter Four

The Lending Advisor case study

4.1 Introduction

This chapter is divided into ten main sections that detail the Lending Advisor project in UK Bank and forms Part Two of the dissertation. This first section outlines the structure of this substantial chapter. The second section then provides a brief history of UK Bank, which helps understand how its culture and organizational structure developed. UK Bank will be portrayed as a very traditional, 'family-run', hierarchical organization with a patriarchal attitude to its staff. Characterised by its extensive domestic branch structure, UK Bank managers tended to have strong links within local communities.

The third section moves on to examine the serious losses experienced by UK Bank in the early 1990's and the role that Lending Advisor played in this crisis. Drawing on interviews with senior members of the project team, this section outlines the process of procuring the Lending Advisor package, forming the project team and establishing the project goals.

The fourth section briefly describes technical details of the Lending Advisor system. The basic components of an expert system are briefly outlined in order to explore the particular variation represented by Lending Advisor. This helps the reader understand the technical opportunities that Lending Advisor offers, and also some of its constraints. The section draws on interviews conducted in the USA with Lending Advisor's inventor, who offers his own interpretation of what he designed it for, and what he would anticipate to be the likely consequences of its use.
The fifth section examines how Lending Advisor was customised by Engine Inc. consultants and the UK Bank information technology team. The knowledge engineering process is considered in detail and draws on interviews with knowledge engineers and consultants on the project. User testing revealed two areas of weakness in Lending Advisor, agriculture and property cases. The section outlines how UK Bank responded to these limitations and the problems that they encountered. Finally, the pilot stage of the project is discussed, along with the various time pressures that were felt by the Lending Advisor project manager to implement as soon as possible.

The sixth section describes the training process and considers in detail how early dissatisfaction from managers caused it to evolve over time. The material in this section is based on attendance at a residential Lending Advisor training course, and the comparative study of twenty Lending Advisor manager/users.

These interviews also informed the seventh section which focuses on the way in which the Lending Advisor team managed expectations and organized implementation. It describes the greenfield site where Lending Advisor was introduced including the nature of the hardware installed and the very low level of IT experience found among users.

A substantial eighth section documents the experiences of the managers during their early use of the system. It considers how their use of the system and response to it changed over time. It is divided into four sub-sections. The first sub-section examines the managers' concern about the typing required for Lending Advisor use. The second sub-section considers how their experience on Lending Advisor developed and led them to realise more and more of its limitations. The third sub-section describes the managers' changing perceptions of their thinking and working routines. The fourth sub-section briefly reviews the impact of reliability issues and downtime.

The ninth section in this chapter is also a long section; it documents the later stages of Lending Advisor implementation and use. It is divided into six sub-sections. The
first sub-section describes the extensive organizational changes and programmes of rationalisation within UK Bank during the later stages of Lending Advisor implementation. The second sub-section considers the shifting role of administrative and secretarial support on Lending Advisor. Some of the obstacles to Lending Advisor use encountered by both the LA users and the LA project team are considered in the third sub-section. The introduction of a new format for Lending Advisor cases, known as Chapter 23, is discussed in the forth sub-section. The fifth sub-section describes the Lending Advisor team's response to managers' clamour for laptops. It also considers the impact of delayed system enhancements on users' perceptions of Lending Advisor. The Lending Advisor team encouraged managers to expect significant time-savings on loan assessment and processing. The failure to realise these time-savings and the considerable impact that this had on the morale of managers is discussed in the sixth and final sub-section.

Section ten concludes the chapter and Part Two of the dissertation. It considers the future of Lending Advisor and briefly outlines UK Bank's new project, Lending Advisor II.

4.2 Profile of UK Bank before LA

The origins of UK Bank go back to 1896 when twenty family-owned, private banks amalgamated to form UK Bank. During the period when UK Bank was expanding through purchases of other local banks, it faced the need to provide for their management without damaging goodwill or destroying the essentially local character of its new acquisitions. It was felt that the customers of a local bank could hardly be expected to warm to the taking over of their bank whose owners had, as it were, been part of their own countryside. UK Bank therefore adopted a policy of appointing the former owners as local directors, and in some cases as directors of the main board as well, and of leaving in their hands the day to day management of the business.

Policy in such fields as lending, staff salary scales, and the opening and closing of branches, was a matter for head office in London, and very large lendings and senior managerial appointments required head office approval. Within that framework, it
was for the local directors to manage their District in the light of their knowledge of local conditions.

Descendants of those original families continued to play a significant part in the running of UK Bank throughout the succeeding one hundred years. Indeed, it was not until 1988 that a man who was not a member of one of those founding families became Chairman of UK Bank. To quote the UK Bank Chairman 1951-1962: 'From time immemorial our local directors and the partners in the private banks before them had many advantages in competing locally with the branches of the (other) joint-stock banks, but they were with few exceptions untrained and inexperienced in the wider field of business life. To be the son-in law, or nephew of a partner was sufficient qualification' (Tuke and Gillman 1972).

A significant change occurred after the war of 1939-45. Young local directors returning from the armed forces were sent, with the rest of the staff, to what was described as a 'refresher course' at the newly formed 'bank school'. Their potential successors were given a carefully considered curriculum of training, including attendance at the various courses and wider experience generally of the UK Bank's activities.

UK Bank began to introduce a mechanical book-keeping system into a few large branches in 1929, but it was April 1960 before hand-written ledgers and statements were finally replaced in the smallest branches. However, in 1959, UK Bank became the first British bank to order a computer to be used for branch book-keeping, and on the 14th August, 1961, the customers ledgers and statements in a major central London branch were posted by a computer for the first time. By 1969, 394 branches of a total 2418 full accounting branches relied on a computer, and conversion of the rest was in progress.

4.3 Lending Advisor in UK Bank

On 6th August 1992 UK Bank cut its dividend, and announced that it had written off £2.6 ($4.1) billion of bad debts. UK Bank's 'pre-tax profits plunged by more than 80% in the first half of 1992, falling to £51 million...from £378 million...in the
corresponding period in 1991’ (The New York Times, 1992). UK Bank were by no means the only ones to suffer losses during this period - only one of Britain's ‘Big Four’ clearing banks was able to announce an increase in its 1991 earnings, but their losses were perhaps the most dramatic among the major UK clearing banks (The Wall Street Journal, 1992).

Six months before the news of the losses broke, the CEO of UK Bank appointed an additional UK risk management director to review the way that the organization managed risk. Unlike the other UK risk management directors, he would not be involved in day-to-day lending decisions. The CEO, who was known for his traditional management approach and emphasis on cost containment initiatives, took the unusual step of allowing this MD carte blanche to explore the current situation. As the MD said, ‘At that point we knew that there were going to be tears, it was just a matter of when’ (director, design and development team, 1996).

The MD seconded a handful of ‘stars’ to work with him. These were people he perceived to have particular strengths. He brought together ‘people who were capable of thinking outside the conventional box’ and ‘people who took a more conventional approach’. They came to be known as the Design and Development team and he continued on the project as director. ‘There were 8 of them on the LA project in the early stages. It was very much a hands-on, small multi-functional team’ (director, design and development team, 1995).

In the past, a recession had resulted in fingers being pointed at various individuals or groups. The project director reflected on this and decided to take a different approach: ‘Wearing a hair shirt and blaming the management of four years ago is a cop out. You can’t ever put yourself in their shoes in that time and that place, and so judging them with the benefit of hindsight, was not an adequate way to address the problem’ (director, design and development team, 1996).

So, the project director ‘began by placing a flip chart in the corner of the room and starting the ball rolling by asking why we were in the situation we were, encouraging them to think the un-thinkable, challenge the established - we brainstormed.’ (director,
design and development team, 1996). They focused on some fundamental questions: what is the basis of our lending expertise? What are the best practices in lending? What is a quality portfolio?

The Design and Development team constructed a logo in order to ‘acknowledge’ their ‘reality’ (director, design and development team, 1996). The circle represented the universe in which UK Bank exists. The wave going through it represented the economic forces that they would not be able to tame in their business environment. The arrow cutting a way through all this was the new UK Bank strategy, supported by the triangle at the bottom of the picture which represents the UK Bank managers.

![Diagram](image)

**Figure 4.1 Lending Advisor project strategy**

When they began asking UK Bank lenders what ‘quality’ in lending practices was, they often got the reply that they would never be able to find the rules that defined quality because lending was a gut feeling, or an art. ‘I would say to them, so you can’t define for me what a quality portfolio is? “Yes”, they would say, “you can.” So, I would sit them down and say, well, OK, how do you define it? I had to cajole them and...over time they broke down the structure of how these managers went about lending.’ (director, design and development team, 1996).

The conclusion of the Design and Development team was that a quality portfolio was achieved by the ‘rules’ that guide the loan assessment process. ‘These rules had to be ‘flexed’ in a timely way in anticipation of the economic cycle and be in line with the overall strategy of the Bank’ (director, design and development team, 1996). Next, they asked the questions: What existing rules and legacies have to be addressed before change can take place? Who is best placed to give you the necessary information in
order to construct these rules and ‘flex’ them? How could they gather together and then communicate throughout UK Bank the ‘best practices’ from their middle corporate management at the ‘coal face’ of lending in branches and business centres around the country?

In 1994 there were approximately 11,800 members of staff in UK Bank, of whom 6,700 were lenders with personal discretionary limits of between £100-£1 million. The £40 billion portfolio generated by UK Bank was difficult to monitor and manage. ‘It was felt that there was a lack of information available to managers on which to base their decisions’ (project manager: policy and lending experts, 1994). One of the consequences of this was huge concentrations of lending in certain industries, a major reason why UK Bank had lost money. It had not been aware of its considerable exposure in an over-heated property market, which subsequently went into recession.

At about this same time, developments in database management, artificial intelligence and risk management were combining to produce a new way of approaching the issues being raised by the Design and Development team. UK Bank’s portfolio represented approximately 23% of the UK domestic market. During the course of the millions of transactions that UK Bank processed, they accumulated a massive amount of data on their customers. These data had the potential to tell them a lot both about their customers, their best practices and about the UK economy but it lay redundant in transaction processing mainframes.

During the course of their research, the Design and Development team went to the USA where the financial services industry, especially the credit card companies, had already begun to try and harness the data on their mainframes through their use of datawarehousing (Inmon 1992) and other decision support systems. They began to see that ‘this technology fitted our strategy’ (director, design and development team, 1996). One of the project director’s colleagues had been ‘pestered’ by a company called Engine Inc. and passed their details on to him thinking they might be of some use. ‘Lending Advisor dropped into my lap’ (director, design and development team, 1996). They finally felt they had found the means to achieve some of the changes that they felt were necessary for UK Bank.
By this time UK Bank had announced its £2.6 billion write off. The project director remembered: ‘I had a burning platform to work with - always a great ally to a change agent’. The Design and Development team presented the business case to the UK Bank Board. Lending Advisor was sold to them as a ‘low cost project’. The cost of the software was around £1 million. They supported the business case with examples of other similar systems developed by Engine Inc. in Canadian banks where it had improved ‘bad and doubtful’ debts. Even an improvement of one percent in UK Bank’s performance in this area would pay for the system.

The business case to the UK Bank board was kept to these fairly straightforward terms. As the project director said, ‘You can’t sell too much at once...The implications of LA for the longer term, the focus on strategy and the vision of LA was held within the risk team. Among the team I sometimes described it as ‘a crowbar to open a fanlight’...I recognised the profundity of it [Lending Advisor] and the idea that it could lead to strategic changes. However, these were regarded as potential opportunities at that point rather than a deliberate programme of change.’ (director, design and development team, 1996).

The choice was then between a thorough (but slow) evaluation of the Lending Advisor system by UK Bank’s own information systems development team or trial by pilot. Again the burning platform helped create a sense of urgency and the pilot was funded. The project director said, ‘We really didn’t have to sell the system because of the situation’.

With a newly approved budget under its wings, the Design and Development team appointed an LA project team. The team was divided between the information technology centre in the north west of England, responsible for technical development, and the business team in central London who analysed the business needs. The Lending Advisor business team spent the next six months thinking through the issues and concepts involved in the project. They assessed the role of branches and regional offices and looked for where ‘value was added to the loans
process' (project manager: policy and lending experts, 1994). They broke the loans process down into the different ‘sales driven’ parts and ‘recovery’ (see figure 4.2).

**Figure 4.2 Re-designed loans process**

A ‘vision’ began to emerge among members of the Lending Advisor team and a proposal for a new strategy took shape, modelled on the divisions that they perceived to exist in the business process. Branches would remain as a point of contact for the customer. However, the majority of lending would be done through UK Bank business centres where experts would assess risk and monitor it. Instead of their application passing through hierarchical layers (up to 17 in the existing structure), the customer would get one-to-one contact with an expert who had the authority to proceed with the loan. This would speed up and streamline the loans process. The expertise of ‘recoveries’ from ‘bad loans’ would be located in regional centres and not in business centres or branches. There would be a small amount of overlap with business centres so that they could advise each other, for example, ‘if a loan is perceived as high risk they might confer with the recovery centre who would advise them on the likelihood of successful recovery in the event of the loan going ‘bad’.’ (project manager: policy and lending experts, 1994).

Having described the background to UK Bank's choice of system and the strategy that the Lending Advisor team nurtured amongst themselves, this is perhaps a good point at which to describe the system - before it was customised and afterwards.

### 4.4 Technical description of Lending Advisor

Lending Advisor was the ‘brain child’ of a group of US-based academics who had been involved in artificial intelligence research in the 1980s at Stanford, USA. They worked on the development of knowledge-based information systems, and one of their systems was put into use by a petroleum company. This system was LISP-based, and designed to identify deposits of minerals. The system successfully identified a deposit
of a rare metal which stimulated considerable interest. A group of venture capitalists felt the research had commercial potential and, in collaboration with the researchers, formed Engine Inc. Subsequent research by these investors identified banking as ‘a potential domain for the product, even though ‘...none of the company members had any expertise or background in the banking industry at all’ (one of the inventors of Lending Advisor, 1995).

In order to consider the distinguishing characteristics or nature of Lending Advisor a brief outline of the features of a ‘typical’ expert system would perhaps be helpful. A typical expert system consists of a knowledge base, an inference engine, a user interface and a working memory (see figure 4.3). The knowledge base is usually built from IF-THEN production rules that relate to the domain in which it is going to be used, for example MYCIN in the health sector (Shortliffe 1976).

Figure 4.3  A simple expert system model
(From Doukidis & Whitley, 1988)
The inference engine takes rules one by one, manipulates them and puts new facts into the knowledge base. ‘Typically in a production rule system, the inference engine uses some form of logical deduction to provide answers’ (Doukidis and Whitley 1988). If it needs to have more data in order to perform this function, it will ask the user through the user interface. The expert system communicates with the user via the user interface, using the screen and keyboard. Once the inference engine has the data or facts, it manipulates them, and any new facts that it derives are stored in the working memory. The working memory ‘contains details of the state of the system’s knowledge at a particular time’ (Doukidis and Whitley 1988).

The inventors of Lending Advisor defined their terms in a distinctive way. For them, knowledge engineering is ‘essentially a form of programming, differing from conventional programming primarily in that it is non-procedural’. They define a knowledge base as, ‘a program in a nonprocedural language’. They see the inference engine as the ‘interpreter for that language’ and the professional knowledge engineer as a ‘software engineer’ (Duda, Hart et al. 1987).

Lending Advisor was developed using Syntel™, a knowledge representation language unique to Engine Inc.. Syntel is described by its authors as a ‘nonprocedural dataflow language’ (Duda, Hart et al. 1987). Expert systems built using Syntel differ from rule-based systems like MYCIN, because instead of following procedures, where the inference engine performs a series of steps involving the IF-THEN rules, it is based on a ‘state network’. A state network is a network of facts and works on the basis of associations, in other words if you know ‘x’ and ‘y’ then you can deduce ‘z’. It is an ‘outgrowth’ of other network-based systems such as PROSPECTOR (Duda, Hart et al. 1987). ‘Unlike typical rule- or frame-based expert system shells...Syntel is a data-driven, purely functional language providing probabilistic inference plus many kinds of functionality associated with spreadsheet and database systems.’ (Duda, Hart et al. 1987).

Lending Advisor works not on the basis of facts and rules, but by manipulating the data input by the user, or stored in its memory, according to the associations stipulated by the networks and the probability distributions or values assigned to them. So, the
user enters a new value for ‘x’ and waits to see how this effects the network of states, just like a spreadsheet.

The networks in the Syntel knowledge base are designed by considering data flows, data elements and interactions, following De Marco’s (DeMarco 1978) Structured Systems Analysis. They use the classical Data-Flow-Diagram/Data-Dictionary (DFD/DD) methodology for program specification and documentation. It supports their nonprocedural approach by allowing a top-down method among the knowledge engineers. Development effort is focused on the relationships and data transformations that take place in the state network until the model reaches the level of primitive data elements. The Syntel language then specifies the weighted-voting function which provides input for the probability representation process.

The Syntel language supports an inference engine. The inference engine must determine whether or not a variable is defined, and if so, compute the probability distribution for its values. The basic function of the inference engine is to then ‘propagate forward through the equation network the effects of changes to variable values’ (Duda, Hart et al. 1987). This is then represented to the user in the form of an assessment of risk.

The delivery environment at UK Bank is distributed, with the knowledge base and inference engine running on an IBM mainframe, and the users working on IBM 386 PC’s. Before Lending Advisor is implemented basic historical account information is entered by clerical staff. Historical account information is usually held by the local branch or business centre, but to ease the implementation process it was sent to remote data processing areas for data entry. The UK Bank historical account information typically consisted of information sheet data (including records of communications and interactions with customer); historic turnover; average balance; range figures (worst and best figures); and historic balance sheet extractions.

When Lending Advisor is introduced to the loans process, the manager enters data gathered from the interview and application form into the relevant fields of up to 52 Lending Advisor screens. The user interface display is based on the metaphor of a
The Lending Advisor introductory training manual (1995) informs us that the 'principle purpose of Lending Advisor is to provide lenders with an analysis of a borrower's capacity to repay debt out of future cash flows. To enable the system to function, lenders input historical financial information and their subjective assessment of the borrower's management and market potential. The system analyses the hard and soft data and produces guidance in the form of advisory ratings'. A typical Lending Advisor assessment meter is shown in figure 4.4 below.

![Figure 4.4 Typical Lending Advisor assessment meter](image)

The LA assessment appears in the form of 'boxes with a minus sign marked on the left and a plus sign marked on the right. ... Assessments are shown graphically as fuzzy gauges that we call "meters". Meters display an ordinal variable's value as a shaded bar whose position indicates assessment value and whose width indicates uncertainty in the value. By convention, the meter's left side always corresponds to unfavorable assessments and its right side always corresponds to favorable assessments, with the center being neutral' (Duda, Hart et al. 1987).
The Lending Advisor introductory training manual (1995), describes the interpretation of assessment meters in the following way: 'Meters are designed to illustrate a measure of risk and to indicate how confident the system is in its assessment. The system does this by showing meters ranging from - (or unacceptable) on the left, to + (or excellent) on the right... [see figure 4.4 above]. All meters have seven points...shaded with black, dark grey and white. The shading corresponds to different degrees of certainty. The wider the segment of shading, the greater the degree of doubt; conversely, the narrower the shading the greater the certainty. Thus, an area of solid black indicates a 50% probability that the outcome will fall within that band; this is known as the 50% interval. On [figure 4.4] this corresponds to only one segment, classified as average. The area of dark grey indicates a 90% probability that the outcome will fall within the black and dark grey areas combined: the 90% interval. On [figure 4.4] this corresponds to the segments classified as poor to good. The remaining 10% probability, falling outside the 90% confidence interval, is represented by the unshaded area'.

The inventors of the system explain how this representation relates to the internal process in the following way: 'the system associates probability values with every point on the discrete ordinal scale. Our convention for graphically displaying probabilistic assessments is that solid black bars show 25th to 75th percentiles, and the union of black and gray bars shows 5th to 95th percentiles; users typically interpret black regions as the “most probable zones” and gray regions as “still plausible zones”. Such graphical displays provide an overall impression of the risk profile, quickly revealing problems at a glance' (Duda, Hart et al. 1987).

If the initial Lending Advisor assessment is negative, the loans manager either abandons the application, pursues additional data that might influence the meter further or 'overrides' the meter reading by writing a 'footnote' mitigating why it is negative. There is a 'clarify' command which provides 'elaborate rephrasing of questions and guidelines' during input. A Show Reasoning command 'provides explanations by searching paths back to supporting inputs' (Duda, Hart et al. 1987). Viewpoints are provided which allows the user to access 'selected parts of the
knowledge base’ (Duda, Hart et al. 1987), for example, background reports on industry trends.

A senior software developer within UK Bank said that the ‘basis of the system lies in two things’: the connectivity between fields populated by the user, which are ‘weighted’ using a quantitative probability technique; and the distributions underlying this approach. The subjective probability distributions are updated using Bayes’ approach. There is a discriminant function involved - but the developers wouldn’t say exactly what they used. Lending Advisor is ‘very data driven. The point at which the data has been calculated is important’.

Similar systems have been in full use since 1986 in North America. The first system developed by Engine Inc. in the financial services sector was for American International Group, a New York insurance company in 1986 (Duda, Hart et al. 1987). It has been implemented in several Canadian Banks, for example Canadian Imperial Bank.

4.5 Customisation of Lending Advisor

The technical description of the Lending Advisor decision support system refers to a ‘knowledge base’. This was established from two sources. Firstly, a knowledge engineering process involved consultants from Engine Inc., working in the Syntel language, with the UK Bank LA team and 'experts' from the UK Bank lending field. The aim of this was to gather together 'best practices' within UK Bank. Secondly, external sources, for example Dunn & Bradstreet. This process focused on gathering data that would help Lending Advisor take account of the economic environment in which the loans process would be taking place. As the process by which the knowledge base was established is of considerable importance to the performance of the system after implementation, it is described here in some detail.

The first project manager on the Lending Advisor Business team had a dual role as policy and Lending Expert. He was an experienced and well regarded 'line manager' seconded from the corporate lending domain within UK Bank's domestic network. Using his own personal 'network', and that of other members of the Lending Advisor
Business team, he identified individuals who had built up expertise in lending areas across the UK Bank branch network. 'The were chosen on the basis of perceived reputation and performance. They were not necessarily located in the same geographical area as one another' (project manager: policy and lending experts, 1994). These 'lending specialists' took part in brainstorming sessions with the 'knowledge engineers'.

These sessions took the form of 'workshop style groups', where they were 'educated in how to document the processes and procedures that they go through when the make a loan' (project manager: policy and lending experts, 1994). Early requirements analysis focused on identifying 'entity relationships and families...later they began concentrating more on the issues and related processes for the live system' (knowledge engineer, LA project, 1994).

The UK Bank lending 'experts' were asked to vote on weightings, giving them a score out of 100 according to what they felt the most pertinent criteria were in the loans process. 'For example, they were asked to vote on the importance of comparing business loans with its peers; or of taking financial trends into account; or of using lending 'rules' to guide the expert or manager' (project manager: policy and lending experts, 1994).

Some of the 'experts' were sceptical about this voting process to begin with. Most regarded lending as 'part art, part science', and felt uncomfortable structuring the process in this quantitative format. However, the project manager argued that whilst 'the voting was an incredibly intuitive process, it was amazing how much consistency there was across the board between experts...It was interesting to present the experts with the breakdown of results drawn up by the other groups - most agreed with it' (project manager: policy and lending experts, 1994).

The experts 'very rarely' agreed completely, but 'small deviations' were 'not a problem' as the knowledge engineers were still able to make a judgement on what represented the 'modal point...The system was calibrated between experts' (senior UK Bank software development consultant, 1994). At this stage, 'idiosyncratic voting was
scoped out... The exceptions to the group expert's opinions are shown on the meter in the LA system. For example, when most of the experts agreed, this was represented as a 90% certain basis for a decision. Where there was more disagreement, it was reflected as a 70% chance of the decision being a good one' (project manager: policy and lending experts, 1994).

Once the weightings had been established in the knowledge engineering workshops, evaluation of the criteria continued through a further process called User Confirmation Testing. The project manager, an experienced loans manager, analysed a one and a half billion pound sample of UK Bank's portfolio with Lending Advisor to see 'how it would look' (project manager: policy and lending experts, 1994). He then put together a selection of cases in which, in his words, 'normal decision making would apply'. A sample of the expert managers were then brought in, and asked to run the test cases and compare their decision making results supported by Lending Advisor assessments with their own judgement of the loan application.

A group of UK Bank expert managers were also taken to IBM 'User Labs' in the UK, where they were asked to assess a series of loans. The Engine Inc. consultants and UK Bank business team observed the way in which they considered the loans, and specifically the analytical and logical processes that they used. Their aim was to ascertain if the questions asked by Lending Advisor were well focused. 'They logged the areas where the participant appeared to have doubts and took note of this for further development' (senior UK Bank software development consultant, 1994).

The results from sessions with the 'experts' were referred to outside experts who validated them. For example, companies that specialised in finance within certain industries and companies, to whom UK Bank had previously turned to for expert viewpoints on areas of the economy, were approached for input.

Lending Advisor was continuously evaluated throughout this period and, in broader, more generic business loans, the Lending Advisor team were finding that the Lending Advisor assessment was confirmed by their trial users. However, during this period the 'experts' did identify two specialist areas that Lending Advisor was not able to
make useful assessments: property and agriculture. This was significant, since over-
exposure in the property sector had accounted for the majority of UK Bank's recent
losses. In 1992, the Lending Advisor team and Engine Inc. decided to build separate
agriculture and property 'modules'.

Twenty 'experts' in agriculture and property were brought together and 'asked how
their credit appraisal processes differed within [their] areas of specialisation' (project
manager: policy and lending experts, 1994). One property and one agricultural expert
were seconded to the Lending Advisor team. Work continued on these two modules,
but they were not included in the first release of Lending Advisor. By the end of
1996, they had still not been fully integrated with Lending Advisor, which was now in
use throughout the UK domestic network.

In 1994, Lending Advisor was taken - minus the property and agriculture modules - to
two pilot sites: south Wales region and the south east region. The pilot was run over a
six month period, involving 200 managers, to identify any major problems before
going nation-wide. One of the knowledge engineers working on the pilot described
the changes made at this point as 'minor amendments...to tidy it up' (knowledge
engineer, 1994). The pilot was considered a 'success' by the Lending Advisor project
team, although feedback from it did confirm the need for the property and agriculture
modules which were still in development.

'Time to market from the concept stage of Lending Advisor was very important. UK
Bank was aware that their competitors were also considering systems like this'
(project manager: policy and lending experts, 1994). Concept stage began in August
1992, and by December 1994, Lending Advisor was supposed to be fully
implemented across the UK Bank domestic network, and handling £20 billion of
business. The project manager emphasised how important the customisation stage
had been: 'UK Bank was ahead of many others in the banking sector because they
enhanced the basic [Engine Inc.] product so considerably. Lending Advisor
represented 20-30 man years of investment' (project manager: policy and lending
experts, 1994). His expectations at this point were high: 'Lending Advisor represents
the fruits of [our experts'] experience and makes sure that branch managers and
business centres ask the right questions, informed questions. This means that, even if it is a highly specialised loan, the person who finally makes the decision will have the appropriate information in front of them' (project manager: policy and lending experts, 1994).

4.6 Training

A training program was written by Engine Inc. consultants, the LA team and UK Bank central training. The training took place in a residential centre just outside of London, leased by UK Bank. The UK domestic network was divided up and the first wave of users began coming through the centre early in 1994.

The early courses were characterised by most of those involved as 'poor' and as having 'teething pains' (trainer, UK Bank, 1995). They were led by Engine Inc. consultants, some of whom had not even worked on the Lending Advisor project and did not know the system or domain that well, rather than practical bankers, which was not well received by the users.

The Lending Advisor project manager/policy and lending expert (1994) described this early phase of training in the following way: 'The managers were initially given two days training. It soon became apparent that they were going to need one week's training and lots of back-up. They (sic) hadn't taken sufficient account of the fact that this was the first time that middle managers had been asked to use a computer. As far as the 'backroom staff' were concerned they had used information systems for years and a new system was therefore not a big culture shock. It was much different for the middle managers'.

Later courses, including the training sessions attended as part of this research study, were all one week long, and led by UK Bank lending managers who had been seconded onto the Lending Advisor project training team. Although the courses were extended, the days were still long. Managers commented that usually on residential courses they 'learnt as much talking to each other in the evenings in the bar' as they did in the sessions (user/manager, training centre, 1995). The Lending Advisor courses began at 8.30am and often stretched until 7pm. This proved intensive,
stressful and exhausting for those who had never even sat at a computer before. 'Getting the managers through the courses involved lots of one-on-one mentoring. This involved trainers sitting, or kneeling, next to the user as they worked on the machines and talking to them' (trainer, 1995).

The week long courses were taught by using case studies which the trainers worked through with the group. The group was informed that customer information and historical financials were input for them at Remote Data Input Areas. The trainers helped the group populate the 'expanded analysis screens' including, for example: 'judgementals', 'management analysis', 'industry risk', 'financial management evaluation', and 'projected financials'.

The one week the training course was an improvement on the original two day format but it didn’t change the fact that managers were going to have to come to terms with using a computer-based information system in their everyday work processes for the first time in the bank’s history. This week long introduction was the canvas on which managers would colour their first response to the Lending Advisor system.

The Lending Advisor project team had discussed with the training team the potential problems facing them as ‘agents of change’. They knew that some of the users/managers were going to struggle with the Lending Advisor system. They anticipated a significant challenge in this respect from the older managers who they thought would prove ‘technologically cold’ (project manager/policy and lending expert, 1994). However, they were taken by surprise.

The age range of the users/managers was between 26-60 years. Senior managers, of middle-age, proved to be relatively quick to train on the LA. It was actually the younger managers (30-40 years) that presented the biggest problems on the training course. The Lending Advisor project manager said that this was perhaps for two reasons. Firstly, the 30-40 year old group had missed out on the technological revolution in their schooling. Secondly, they trained as managers during the 1980's boom period when a lot of lending was based upon property. They were, in his opinion, actually incompetent at the appraisal process. 'LA training highlighted their
incompetence. They had a different skill base that relied upon a constant upward trend in the property market...managers in their 40's and upwards realised the benefits of LA. They were experienced in branch management and appreciated how this empowered them. The 30-40 yr. olds did not have this mature background.' (project manager/policy and lending expert, 1994).

The users/managers were encouraged to work in groups on the course, and to discuss their usage of the system with their colleagues. In the past, it was often seen as a sign of weakness within Bank culture if a 'coal-face' branch manager had to ask a question about a loan. The Lending Advisor project manager/policy and Lending Expert (1994) pointed out that they were not unique in this respect: ‘In fact it is even worse in French banks where managers don't feel they can communicate with senior management at all. LA is part of an initiative to create a 'politically neutral' source of information to support the managers' efforts'.

It was not clear that the majority of users/managers had the same perception of Lending Advisor as 'politically neutral', but perhaps for other reasons. ‘One of the biggest fears communicated by users at the training is that their jobs will be done in the future by less well paid, less skilled people’ (trainer, 1995). The introduction of Lending Advisor marked the beginning of a stressful phase in the career of most users/managers. This was not helped by early attempts to achieve the higher level goals of the Lending Advisor project, when the overwhelming - or perhaps 'overwhelmed' - majority were metaphorically struggling to find the computer’s ‘On’ button. For example, in the early week long courses, trainers told managers to find their own 'best practice' and discover the most effective way through the 52 screens as they constructed the loan application for themselves. ‘The Bank never wanted to produce a set analysis path for Lending Advisor. They wanted the managers to develop their own’ (trainer, 1995).

This probably contributed to the sense of confusion experienced by many managers. For example, one of the users/managers said that, when he was told that there were 52 screens on the system during the training week, he ‘felt like I was sitting in front of a maze’. He said that there didn’t seem to be a ‘structured approach or...logical
sequence' to him in the training. He felt as if they were saying, 'Here's the maze, now find your way out'. The trainers received so many comments on this point, that some of them developed a suggested analysis path of their own, that they handed out to the groups they trained. One trainer said that this was just to get them started and that 'after a year's use of the system, they will develop their own pathway regardless'.

Whether they had an analysis pathway sketched for them or not, most managers described themselves as being 'mortified' and 'overawed' by the course. At best, the majority of the user/managers found the course: 'too much, too fast'. A small number of managers discovered a personal aptitude for computers and coped well with the course, but they tended to be the exception. A user/manager in the Cambridge region commented that: 'There were others on the course who were apprehensive, but I thoroughly enjoyed it. Time just flew. I decided that I would have a go and found it reasonably straightforward. In fact, I became frustrated with those on the course who were slow on the hardware.'

One of the trainers (1995) commented that in a period of a few months at the training centre he would get 'two or three users that can't handle the system at all. They generally end up leaving early and going home. But on the whole, even if the user struggles, they will stick with it'.

An early part of most middle managers' career was spent as an advances analyst in regional office learning about the risk process. Advances analysts are part of a team that assess loan applications submitted by branch/business centre managers when they are beyond their personal discretionary limit. They also, therefore, had to be able to use Lending Advisor. At the end of their one week training, a group of advances analysts were asked if they felt that they could get around Lending Advisor better now after they had been on the course. There was a mixed reaction, but most agreed that 'using the system was better than getting 3 files out of an office store, lugging them about and ploughing through them.' They emphasised the advantage of having access to information in a way that they had not had before.
Although some trainers tried to structure the Lending Advisor analysis process for the users, they also encouraged them to 'look behind the figures'. They emphasised to the group of young advances analysts that 'unless you did this, Lending Advisor is just a number cruncher. It relies on the user challenging the figures and knowing where they come from. Lending Advisor gives the numbers context' (trainer, 1995).

Some of the users, however, had a more pragmatic approach, and wanted to be told how to get the job done quickly as well as effectively. For example, one of this group of advances analyst in his mid-twenties, from the Cambridge region, was asked during a break what he wanted from the course? He said that he wanted a 'better guide on things like credit analysis'. He was looking for 'pathways' through the system, rather than 'going through all 51 screens, hoping to hit on an analysis'. He knew the basics [Lending Advisor had already been implemented in his office and he had 'played with it'] and 'wasn't here for that, really'. He was a bit frustrated that they hadn't come up with what he wanted from the course, yet. They had given him a handout on the issues that he had asked about, 'but it basically said "Find your own way through the system". They wanted you to develop your own technique and analysis method, but this takes time, I'm trying to save time!' (advances analyst, 1995).

This young advances analyst attended one of the last one week courses. Although the one week format was an improvement on the original, it still raised issues for all involved. ‘The problem is that people come to the course expecting to leave experts...The major learning should take place back in the branch’ (trainer, 1995).

4.6.1 The revised training method
In mid-1995, one year after implementation had begun, the format of training was changed in response to feedback from users, local application managers and the training team. Modular training was introduced which allowed managers to learn in short, one day bursts, and then embed what they had learnt through practice at their branch on their own accounts.

A series of skills workshops were also developed to reinforce some of the basic training issues referred to by both the project manager/policy and lending expert and
the project director: ‘Some managers are weak at credit. The training and LA use showed this and raised some training and skills issues that they weren’t expecting. There are advanced Lending Advisor courses in process, and they do aim to cascade skills within the branches themselves. They have also got to focus on ingraining the managers basic training. Some problems have arisen because lending Advisor is a cash driven model. The manager using it therefore has to understand cash flow’ (project director, 1995).

The project director (1995) maintained that he had identified a ‘north-south divide in this respect’. He attributed this to the ‘predominance of tradable services vs. manufacturing industries in the south east of England. The basic approach to manufacturing is a longer term one which involves having to have assets to back loans. You need to have that experience. In the south of England they don’t have those skills. Loans were mostly supported by property. They dealt with the services industries, and had experienced a mainly Tory government’.

In addition, a program of 'twilight training sessions' was organized, involving local Product champions elected from among the users in each branch. The local champion would attend one day courses focusing on effective and in-depth use of the features on lending Advisor, which they would then pass on to colleagues upon his/her return. This ‘cascade method’ proved to be a useful way of initiating periods of learning within the branch/business centre network. The aim was to create ‘a whole support network available to the manager through user meetings and the creation of a 'local champion', to provide a 'first point of contact' for managers and to help foster a sense of 'local ownership' (project manager: policy and lending expert, 1994).

Users began to be seconded onto the Lending Advisor project groups, to brainstorm with the lending Advisor team, about how to improve training and what to include in the next courses. About one third of the managers interviewed had been asked to contribute in this way, and there was a notable ‘buy in’ to the lending Advisor project from them afterwards.
Some of the training modules were developed in response to emerging issues. For example, when the advances analysts were being trained on the last of the one week courses, one of them mentioned tensions between the regional head office and users/managers in the Cambridge region: ‘At the moment there is a debate in the Cambridge regional office about who should check the managers' input on lending Advisor. Should the advances analysts be checking the managers' work or concentrating on the credit analysis?...They don’t usually take this criticism too well from an advances clerk... I always write it under the name of the local application manager, rather than sign it myself.... Managers generally don’t want to be seen to get it wrong, you have to be careful with them’ (advances clerk, 1995).

Subsequent training modules addressed the issue of feedback to managers and other obstacles presented by regional office to the lending Advisor project. A particular effort was also put into training users to use bullet points rather than long prose.

When the project director was asked, in June 1995, if the Lending Advisor training had been a success, he replied: ‘By all conventional measuring systems the LA training was very successful. I felt ‘intuitively’ that if managers went back and used LA after the training, it was good enough. Obviously the difficulty comes with those manager that don’t use it afterwards.... In retrospect, they might have done the training in ‘two hits’, but at the time they were not in a position to do that logistically.’

4.7 Implementation

The most notable feature of ‘first round’ interviews with users was the extent to which the users interviewed had accepted UK Bank's decision to introduce Lending Advisor. The project director (1995) explained, that they ‘dealt with the politics generated by LA by getting [the director of Banking, UK] involved at a very early stage. ... I programmed him. I told him to push the product and to stress that it was an important asset with respect to future portfolio quality; it had got to work; it was inevitable that they were going to have to introduce such a system in the future’

The director of the original design and development team (1996) described how ‘The key here was that Lending Advisor was sold by peers. Only certain people can deliver
certain messages. They approached it from the angle that tomorrow will be better
than today, and today is not acceptable. You have to remember that these individuals
[branch/corporate managers] were experiencing a recession. They were being blamed
individually for certain losses. When they lost good customers they very often lost
good friends in the process. These were people that they had invited to their houses
for dinner, had played golf with, and established good friendly and working
relationships with. When these people walked into pubs now, working for a bank was
regarded as a negative. People turn around to them and ask: “Why did you let us do
this? Why didn’t you warn us that things could go this wrong?” The team therefore
didn’t need to sell ‘Today is bad’, managers already knew that. What they had to do
was try and address the fears of tomorrow.....I felt that it was important to sustain a
high profile on the LA project to try and keep ahead of the grapevine...The LA team
won a higher percentage of the ‘hearts and minds’ of users than expected’.

From the beginning of the project it was emphasised that time ‘to market’ was critical
with Lending Advisor. ‘The project was delivered on time which was unusual within
the Bank and helped win confidence’ (project director, 1995). However, the
implementation of the system was perceived by many as a ‘Big Bang’ (local
application manager, Cambridge region, 1994).

The implementation process was co-ordinated by the Lending Advisor business team,
the training team and local application managers, otherwise known as LAMs. A local
application manager was appointed in each region, in January 1994, to co-ordinate
implementation, and to provide both support and follow-up coaching to users. ‘The
project team knew that the process of change would be painful at times and felt that
the best way of overcoming that was to let the managers talk to peers about their
successes and failures. This is where the local champion [local application
manager/LAM] comes in. The project team needed feedback: is the system doing
what it should? They needed to hear about resistance to change via the local
champion. The LAMs and the LA project team met for monthly meetings where they
could prioritise issues. It was the LAMs job to sustain the positive aspects and assess
the quality of LA’s decision output.’
In order to contain costs, the system was implemented using re-conditioned 386 IBM PC’s. Only Lending Advisor was loaded onto these PC’s, no other software packages (for example, word-processors, spreadsheets, databases, personal organizers) were included. Installation of the hardware was done in waves and sometimes not well co-ordinated with the training of users/managers. The graphical user interface, in bright blue and yellow, only took up two-thirds of the full PC screen. Unlike the split screen, windows versions of Lending Advisor, that had often been used on laptops at the training courses, this version of Lending Advisor could only let the user see one screen at a time. The users were told that laptops were scheduled to arrive by the end of 1995 (LAM, Cambridge region, 1994).

Lending Advisor was implemented into a greenfield site, and there was a significant degree of ‘technophobia’ among managers. ‘LA marks the first time that technology has arrived on the desk of the branch managers. One manager referred to it as the “malevolent blue and yellow eye sitting on the desk staring at me”. The base level of knowledge regarding technology with the branch managers is really base. When LA arrives, many of them are waiting for their first days training on IT ’ (local application manager, 1994).

As has already been noted, Lending Advisor represented a shift in culture, and some certainly suffered from culture shock; ‘Some of the branch managers have an awful lot to absorb about the technology’ (local application manager, 1994). The local application manager (1994) in the Cambridge region said that when he went to install Lending Advisor at one branch he explained to the manager, ‘that this was the mouse which could be used to select commands on the screen. The manager picked up the mouse, pointed it at the screen and clicked it, trying to use it as a TV remote control’. Having no previous experience of computers, the manager had related the mouse to the nearest technology that he had used: a TV remote control.
4.8 Early use

The implementation process began in early 1994. The ‘official’ support for users was provided in the form of a ‘user support structure’ pyramid, arranged hierarchically. The user’s first option would be the ‘on-screen help' and the Lending Advisor procedures manual. From there they could turn, firstly to a peer within their own branch, the elected Product champion; or if they had an application or fault query they could take it to the local application manager (based at regional head office). If it was a system fault or failure, they could call the technical helpdesk (centred at a remote location); beyond that, the LA project business team and IT department were also available to deal with problems that the other groups could not deal with. ‘There was a good communication structure in place to articulate the issues surrounding LA to the local champion [local application manager]. Any technical issues could be taken up with the LA system help desk. The team regularly went on ‘roadshows’ to explain the positive aspects of LA to managers’ (project manager, 1994).

The local application manager became a very important figure to the users/managers and, in the two regions studied, forged very effective alliances with them, balancing their role as change agent with empathy based on their own experience of being a corporate manager. The local application manager (1994) in the Cambridge region said that, ‘Lending Advisor has taken them all through a range of emotions, from amazement to frustration...I go to install the Lending Advisor system...I've never felt so uncomfortable throwing so much information at so many blank faces so quickly’.

Every relevant business case in the managers' portfolio had to be loaded onto Lending Advisor before the system could begin to be used as part of the everyday loans process. This proved to be a ‘painful experience’ for all the managers, (local application manager, Cambridge region, 1994). Background data on accounts had been loaded remotely, but the managers still had to load on the lending history of each customer.

The user/managers in the comparative study described backloading as enormously time consuming, particularly since they were struggling to come to terms with, and use, the technology. The project director said, in June 1995, that managers are being
'sweated harder now than at other times. I know that some of them are currently finding themselves between a rock and a hard place'.
4.8.1 Typing

An issue emerged during this early implementation period which wrong footed the Lending Advisor team. Indeed, in some regions and among some individuals, it threatened the overall acceptance of Lending Advisor. Lending Advisor not only challenged status but also, it would seem, their sense of pride about their work. For the first time, managers who had cherished their reputation and polished their ability for presenting loan applications that would be sanctioned without comment from regional risk analysts, were sat in front of a system which they did not understand. They no longer knew how to do an integral part of their job. The input of all these details was taking long hours of work. Presented with a computer-based information system as a medium for their work, they focused their energy on the seemingly minor issue of - typing.

Many users/managers referred to themselves as ‘expensive beasts’ who were paid for their expertise, not to sit for hours typing with two fingers - they had secretaries to do their typing. The Lending Advisor team did not appreciate the symbolism of typing, and instead saw it as a functional issue: ‘The branch managers seem to have difficulty focusing on what is important on Lending Advisor. They spend ages typing out their comments. Why? They are usually re-stating in prose what Lending Advisor says in the meters and statistical data, it is such a waste of their time. The managers should not be promoting the proposal through prose, they should be concentrating on a technical analysis. That’s ‘The Word’ from [head of UK Risk Management]’ (trainer 2, 1995).

Despite their frustration with typing, some users/managers preferred to see through the loading process themselves, and persevered: ‘Lending Advisor input is not delegatable. When you are loading or working on a cases, you are going through an inter-related thought process. I am a two finger typist, advancing to being a three finger typist. Despite that, I don’t let anyone type my input. I am familiar with what I want to say, so I’m more focused and end up with less waffle. The end result is better if I work on it myself’ (user/manager LL, central London).
However, for the most part user/managers resisted the move to ‘keyboard work’. It was one thing when computers were introduced to the ‘girls and boys in the back office’ but quite another to ‘insult’ a manager’s expertise in this way. A secretary was regarded as a status symbol to many of the managers. Lending Advisor did not allow them to keep the critical distance that they needed between themselves, and what many of them considered to the feminine domain of keyboards and typing. One of the younger users summed it up like this: ‘There is only one secretary, so I had to do my own typing to begin with because the resources weren’t available. I can’t type. I think that the bank should have sent all the managers on a residential typing course. I know that there is a one day course at the Learning Centre in London, but you won’t find any managers going along to it, they would get ridiculed by their colleagues. It is a patronising attitude, but at the bank typing is still woman’s work. ... Now I dictate, giving the secretary the name of the case and my password. Sometimes the secretary is given her own password. She goes into the manager’s office and types. The only one [screen] that she needs to know is the Credit Analysis Comments screen. I sat down and wrote an idiot’s guide for my secretary’ (user/manager ML, central London).

Not all the managers framed the typing issue along gender lines. Lending Advisor also imposed a new style of reporting that confronted many of them, and took time to adjust to. If a manager got as far as making a loan application to regional level, he/she had usually mentally approved the loan themselves. They had been trained to present their work in prose, selling the loan by emphasising its good points; indeed, some regions were known to put a grade for written style on a manager’s loan applications. This came particularly hard to mature managers who had polished this ability over the span of their career. ‘The Bank now wants us to produce ‘bullet points’. But the older managers, like myself, are used to writing 25 page reports. That is the way that I feel comfortable doing my job best. It takes time to change. I thought that perhaps they would provide us with voice activated machines, so that we didn’t need to type; it would have been more sensible, since managers are used to dictating. Instead they installed all these re-constructed PC’s which run really slowly’ (user/manager NL, 1995).
4.8.2 Growing experience: Lending Advisor's limitations

The themes of technophobia, the challenge of adjusting to technology, time and typing were raised by all the users/managers during the first round of interviews. The way in which managers coped with these issues, and adapted their everyday work practices to Lending Advisor, seemed to vary from individual to individual, according to the amount of support that they received, and the environment in which they were trying to learn. ‘No one had time to spend with the managers when the system was first installed which led to a considerable dipping in quality of the work done on the system’ (local application manager, Cambridge region, 1994).

One user/manager described the evolution of his Lending Advisor use in the following way: ‘As my experience with the system has grown, I’ve noticed how my use of the system has changed. In the beginning, I used to put the information on, but do very little analysis using LA. Frankly, the first few applications I submitted using LA, I had no idea what I was being asked to be sanctioned. As time goes on my use of the system is becoming better’ (user/manager SL, 1995). The functional issues raised by users/managers varied depending on their experience with the system; what kind of portfolio they were attempting to manage with Lending Advisor; and the length of time that they had been using Lending Advisor.

As the users/managers gained experience with Lending Advisor, they began to notice the gaps left by the agriculture and property modules that were still in development. Both of the regions under study felt the limitations of Lending Advisor in this respect; London central had considerable portfolios of property investment and Cambridge had concentrations of fenland agriculture. These portfolio concentrations were widely acknowledged as shaping the ‘culture’ of these regions. When these regional characteristics and their corresponding blind spots on Lending Advisor were mentioned to the second Lending Advisor project manager, (1995) she commented: ‘I would be careful when talking about culture within an organization. In my opinion culture within an organization is more influenced from inside than from its environment outside. It is the individuals that form the team, rather than the type of business they handle’. At this stage, Lending Advisor’s usefulness was perceived as a team issue, rather than one of technical limitation.
Users/managers also identified other 'blind spots' in its analysis, for example small businesses and media. Sole traders in small businesses may keep their cash assets hidden, often for tax reasons, or leech the business of cash in the short term to fund their lifestyle, in preference to long term re-investment. If they do this, the Lending Advisor assessment will not reflect their financial position accurately, which puts the manager in a difficult position. In media, film production companies are often formed to develop a one-off film; they therefore have no history, no cashflow figures or anything else to drive Lending Advisor, again making assessments problematic.

Companies with parent/subsidiary relationships were also problematic. One user/manager, whose accounts were typified by group relationships with lots of subsidiaries, where they would have a retail and a licensing division as well as many others, made the following observation: 'When dealing with separate subsidiaries, cases on LA do become more complex. I tend to extrapolate the subsidiaries data and deal with it as the case requires. If there is only one subsidiary in a large group, I show the activities of that subsidiary. However, you do still need to look at the parent. This becomes difficult if the parent is overseas. LA is not so useful in those cases. The peer data becomes really quite spurious. I still put those cases on the system, but I don’t use LA to evaluate them....In some cases, where LA is perhaps not so appropriate, the system becomes a glorified word processor rather than an analytical tool' (user/manager RL, 1995).

Another manager made this assessment of its abilities: 'Lending Advisor cannot adapt to every case. In some circumstances, it ends up just being e-mail. It is very good for manufacturing businesses with cost of goods and overheads. It is not well adapted to service industries where there is a fixed/variable overhead. It also does an American-style gearing which is not appropriate, and which the Lending Advisor team has promised to change. There is a lot of American-style terminology and language which they are supposed to be changing on the Show Reasoning' (user/manager NL, 1995).
Users/managers tend to see many of their client's as unique cases, and often had problems adjusting to the concept of standard categories and the rigid industry codes used in Lending Advisor assessments: ‘The [UK Bank industry code] is such a blunt tool. I am troubled by that. At the moment, the classifications are running to catch up with the business. ... There should be a health warning on these classifications. You don’t draw too many conclusions from them’ (user/manager PL, 1995).

There was one last major issue for the managers in this phase of implementation - that of portability. The long promised laptops did not materialise. The fact that Lending Advisor was only available at the office effectively 'chained' them to their desks. Managers worried about the opportunity costs connected to Lending Advisor, both at home and at work.

Their performance related contracts depended on developing new business for their branch. Managers were concerned that they were not working efficiently or effectively: ‘The lack of laptops has been a real disadvantage. It is my policy to see customers on their own ground. If I go out to visit a customer, and perhaps have lunch with them, I’m unlikely to then spend 50 minutes travelling the distance back into central London in order to write that up, and then have to spend 50 minutes travelling home again. It is an advantage, however, to have the visits written up as soon as possible while it is still fresh in your mind. If I had a laptop, I could work from home. I do take other work home but I don’t feel that this is the most effective use of my time. The interruptions at the office mean that it is difficult to work on LA. I would much prefer to work in the peace of my home with a laptop. I feel that this way the bank would get the most effective use of my time, and that their decision not to provide laptops is really short-termist in an economic sense’ (user/manager RL, 1995).

4.8.3 Thinking paper/thinking Lending Advisor

Six months after most of the Cambridge region managers had been on their introductory training course, the local application manager (1994) was still ‘not convinced that managers understand the answers that the LA system gives them. ‘The biggest challenge is that they are still ‘thinking paper’. They are not ‘thinking in LA
meters’. He emphasised that this was a ‘generalisation but...this situation has to be managed’ (local application manager, Cambridge, 1994).

During implementation, the local Lending Advisor managers faced the problem of managers misunderstanding the way that the meters are supposed to be a part of the loan process: ‘Some have seen it almost as an arcade game seeing if they can move the meters up by playing with the figures. They are manipulating it, not using it. There have been cases where if a manager gets an alert, he will manipulate the figures until it is back in the acceptable zone, rather than have to go through the process of explaining it to head office. It maybe that the customer is a good marketeer, but due to the current conditions in the recession is not showing up well on the meters. Rather than go through the process of explaining this fact, they will ‘play with it’ until it is marked as reasonable. We are trying to manage this response to the system’ (local application manager, 1994).

The shift to 'thinking meters' was a major concern for the Lending Advisor team at this stage: ‘It is very difficult to measure how effectively the manager is interpreting the information’ (Lending Advisor project manager, 1995). Many managers were mentally operating a parallel process of LA and paper, working out a loan first on paper and then when time permitted putting it on Lending Advisor. The primary reason for this was 'habit', but if challenged the managers would also suggest that reliability and portability were also part of their rationale. ‘Paper is always available, and that is what they are up against’ (user/manager PL, 1995).

4.8.4 Downtime and reliability
Downtime and reliability were actually improving, but users'/managers' perception of it was marked by the times when it impacted on their work and coloured by 'horror stories' from other managers; for example: losing work on screen after working all day at the weekend; being unable to access a customer's application on the day of an interview; the system crashing when they were trying to work to a deadline; and so on. The local application manager in the Cambridge region (1994), said that in these circumstances, he ‘doesn’t try to dress up the problems, but tells the managers baldly that there have been some difficulties.’
Managers tended to accept many of the functional limitations of Lending Advisor in this early phase, but familiarity did bring a measure of contempt, as their confidence with the technology grew. For example, they would ask why the system was only visible on just two-thirds of the computer screen, and why the text was hard to read. Managers complained that there were too many screens (52), and that they could only look through one at a time, in contrast to the split screen, Windows systems that they were trained on, a situation made worse as the system was hopelessly slow between screens. Initially, many managers felt they had to look through all the screens, although in the later interviews they were beginning to find short cuts. Interconnectivity between screens was not good; managers had to sit with a calculator next to the computer and work out tax before entering it. Further, when they made changes on one screen they had to go through and update the others. They could not understand why this expensive new system couldn't do all this for them.

There was an interesting change in attitude among managers over time. When Lending Advisor was first implemented, most managers considered it a sophisticated piece of high technology and were a little in awe of it. Over time they grew more familiar with it and could challenge aspects of both its assessments and functionality. Simple limitations in functionality caused many managers frustration; for example, the word-processor did not have a spell check, nor did it have a tab function. Many proud managers spent too long meticulously checking spelling for fear of submitting an application with silly mistakes. Users described the Lending Advisor interface as 'cumbersome'. The more experienced they became, the more this appeared to bother them.
4.9 Later use

4.9.1 A context of organizational change

The later stages of implementation were characterised by further radical changes in the organization of UK Bank, in particular the introduction of the corporate market Program. This involved the re-grading of accounts, which led to re-organization and 'migration' of portfolios between managers. In the second round of interviews with the managers, most maintained that the major issue for them was no longer Lending Advisor, but the organizational changes occurring all around them. This involved changes to the branch network and reporting lines, to where accounts were domiciled and their categorisation.

The managers' risk management career path was wiped away by changes to their grading structure which reduced the eight management grades to three. Now that Lending Advisor produced the statistical analysis required to assess loans, the junior management support personnel were no longer necessary. The concept of working up the hierarchical ladder from clerical grades to risk management through on-the-job training was suspended pending review. This 'streamlining' added to managers' concern about job security and their expert status within the organization.

Managers' reward structure was radicalised with the introduction of portfolio contribution assessment; the primary focus of managers' performance related pay shifted from generating new business, to an assessment of the profit that each individual made for their branch/business centre. One junior manager put it this way: 'The PCA contributions have really changed the way that managers focus on their portfolios and distribute effort to their different accounts. At the moment, the two senior managers at [London] Square are contributing less to the branch income than I am. Needless to say, they feel a little uncomfortable about this. It just so happens that I have a portfolio that, whilst not loaded with extremely large corporations or extremely complex ones, is a profitable portfolio'(user/manager LL, 1996). The change in the way that managers' performances are assessed meant that, for the first time since performance related pay was introduced, credit customers generating income for the branch were just as important and warranted just as much attention as existing customer's with loans or new loan business.
One manager described portfolios as 'rather a moving feast these days...This kind of interruption in service really frustrates customers who appreciate, more than anything, continuity. The bank will lose business if it carries on like this' (user/manager DC, 1995). Their concern about portfolio migration was not only for their customers; there was some concern about the its connection with the new performance measures in their job. Yield from portfolio varied, depending on the type and range of business in a portfolio: 'What would happen if the forty connections that you ended up with yielded a low income for the bank? This would mean that it would impact your performance related pay, so you'd have to go out and develop business to make up your salary. In which case, you would be overloaded with work, for less return. Others might get 40 connections that yielded an exceptionally high income for the bank. I just hope that I'm not in the wrong place, at the wrong time, in the midst of all these changes' (user/manager DC, 1995).

The grading of portfolios was another major change, one which some managers felt would have a bigger impact on UK Bank than Lending Advisor in the long term. The UK Bank business grade (BG) assessed the propensity of the company to 'go down' or default, based on the manager's opinion of the company, its 'fitness' and the security that it could offer. It was given a grade and a 'severity rating' which was supposed to reflect the financial risk of lending to that company. Businesses that fell into the lowest categories, BG seven and eight, were put on immediate exit policy which concerned some managers: 'These accounts do have potential and we are losing a potential income stream for the future' (manager DC, 1995). Critical attention was shifting upwards to the BG6's; many managers felt that cutting down the portfolios in this way was 'possibly a dangerous policy to pursue, because the [BG] 6's may prove, in the long run, to be great companies - or maybe not great - but they won't go down....The current changes are squeezing the bottom of the portfolio....Lending Advisor has made it hard for [medium sized] businesses to get a loan, but so bloody difficult if you are a small business. It is an information driven system and provides an entry barrier for small businesses' (user/manager OL).
During the 1980's, UK Bank had developed a reputation for investing in and nurturing a significant proportion of the UK small business market. It had been considered a significant part of their business in the past, and one that provided a steady income for them whilst other areas, like property, crashed. Managers in the Cambridge region had played a central role in establishing the area as the 'second silicon valley'. In interviews, Cambridge area managers maintained that those same start-up hi-tech and bio-tech companies could not have been justified in the new Lending Advisor lending culture within UK Bank.

Managers were finding that if a business case did not 'fit', they rarely had the time to make it do so. The barrage of organizational change that they were facing was putting them under increasing pressure. A trainer on the Lending Advisor put this bluntly: 'The ground is moving from under the feet of local branch managers in terms of IT and the new cluster formation [groups of branches under a single manager]. The Bank will need fewer of these managers and the implementation of Lending Advisor will bring this about' (trainer 2, 1995).

There was a major re-organization at regional level across the UK, with the obliteration of several layers of upper-middle management. Branches were clustered in wider geographical groups than ever before and, in a further symbolic bid to uproot UK Bank from its geographical origins, the title of branch manager was changed to corporate manager. One manager interviewed said that he would work with whatever cluster arrangement he was asked to, but adamantly refused to accept a change in title. He would adapt to everything else, so long as branch manager remained at the bottom of his letter paper. Meetings followed at which senior management insisted, and he continued to resist. The issue was never resolved. The manager had a serious heart attack on his local golf course, and was forced into early retirement on health grounds.

4.9.2 Administrative and secretarial support

The corporate market programme also brought about a re-organization of administrative and secretarial support. When Lending Advisor was introduced, typing had been an emotive issue for many managers. Secretarial support was allowed for the first year to help type in and load the managers' input on Lending Advisor.
However, beyond this, secretaries and personal assistants had no defined role on Lending Advisor, were not issued with passwords and received no training. Managers relied on them in varying degrees during the early phases of Lending Advisor implementation. In some cases, there was a blurred line between those who delegated responsibility and those who abdicated.

The issue of typing was finally subsumed by the debris of re-structuring. Major reductions were made in the number of secretaries in branches and business centres, as managers were expected to become self-serving. When the managers' comments about typing were raised with the assistant director on the Lending Advisor project in 1996, he commented ‘There was a shortfall in skills levels and managers had to learn basics like hand-to-eye co-ordination and typing. Typing had been an ageist and sexist problem that had been conquered’. When asked what he meant by 'conquered' he replied: 'The managers just had to learn' (assistant director, Lending Advisor project, 1996).

It was not the introduction of word-processing that had decimated the numbers of secretaries, as had been feared in the 1970's, but a re-definition of expert roles following the introduction of computers to middle management in the 1990's. In one branch secretaries were reduced from 10 to 2; in another, they were down from 3 to a single part-time secretary.

The Lending Advisor team members admitted that in the early days of the project the role of clerical support was much debated. 'Clerical support does have a role on Lending Advisor now, including running projections models. The corporate market programme is re-positioning roles. They were also planning to give everyone a workstation in the future. The role of the PA was being reassessed. At the moment you have PA’s who do not have access to workstations that were running LA. How can a PA help a customer without access to the information? A PA will be able to support the managers efforts on LA much more in the future’ (assistant director, Lending Advisor project, 1996). A further consequence of the specialist training needed to use dedicated software programmes like Lending Advisor was that it is more difficult for personnel to move between sectors like personal, corporate and
small business. To move between different parts of the bank, you would have to learn a new information system and new reporting structures.

The Lending Advisor training continued to evolve, in response to feedback from managers. Local, half-day modular training had been introduced and proved a success, helping users with the more complex functions on Lending Advisor, as well as reaffirming some basic training issues. Use of capital structure screens and projections was particularly improved as a result of modular courses focused on them. When asked, in the final round of interviews, if they that felt they had received sufficient training and support on Lending Advisor, the consensus was that it had been 'pretty good'. However, the memory of early training courses lingered, and most managers felt that, although the modular training had been good, it should of happened much earlier.

Asked if the Lending Advisor assessments still corresponded to the decision that he would have made without Lending Advisor a user/manager replied, 'It’s difficult to say now because these days I’m actually thinking LA, rather than paper and I’ve lost the ability to compare my decision making processes between the two' (user/manager LL, 1995). The prediction made by one of the trainers a year before appeared to have been realised. He had said that the situation for branch managers would get easier after they had used the system for a year. Once they were over that critical period, use of Lending Advisor would become 'almost subliminal, second nature'.

4.9.3 Obstacles effecting Lending Advisor use

Whilst the training programme for users grew in effectiveness, certain obstacles were emerging which hampered managers' everyday use of the system. In interviews, members of the project team had insisted that, if Lending Advisor was a threat to job security, it was not in the branches or business centres, instead Lending Advisor 'represents a considerable challenge to regional power (project director, 1995). The consequences of this threat did not become immediately apparent, but over time a pattern of negative reinforcement from senior management within branches, regional management and UK Bank inspection teams, emerged in interviews with Lending Advisor user/managers.
One manager commented: ‘Lending Advisor was not at the top of my priority list, primarily because of the attitude of the senior manager. Officially all the managers in the branch were keen to learn Lending Advisor. But the reality was very different. The ‘do’ versus the ‘say’ were very different’ (user/manager OL, 1995). A high proportion of senior management within UK Bank were unable to use computer-based information systems, least of all Lending Advisor. ‘I’ve seen senior Risk managers at regional level sanction a loan on the basis of the printed off comments, the cash flow figures and the fact that they know the customer. They would rather base their decision of this scanty information than sit and use LA themselves’ (risk analyst, 1995).

Embedding the system, beyond the user/managers, throughout the organizational structure had proved a real challenge. The Lending Advisor team underestimated the obstacles that they would encounter among senior managers and at regional level. Regional management couldn’t see why they had to use this system. Part of the reason for this was a tradition of perceived excellence in credit analysis at regional level. Computers were associated with back office work, they were experienced professionals. ‘Typically, in the Bank, you saw a great deal of arrogance from anyone who had power over anyone else and this was never more so than at regional level’ (assistant director, Lending Advisor project, 1996).

Lending Advisor was used by the regional risk team, but not by their senior managers. Experienced branch/business centre managers would work long hours on a Lending Advisor loan application, only to receive it back with comments from a junior, frequently criticising their Lending Advisor use. This caused considerable friction and led the Lending Advisor team to design an additional training module aimed at regional level. Commenting on this, the current assistant director said that in his view it was ‘outrageous that a junior could criticise a senior. There had always been a lot of politics between the regional structure and corporate or branch level. Both the regions that you have studied were hierarchical, although for different reasons. As soon as the LA team discovered that this practice of juniors criticising seniors was going on, they stopped it. A great deal of effort was put into training regional level in
how to handle these situations. They are now handled completely differently, as outlined in module four of the new training programme' (assistant director, Lending Advisor project, 1996).

In the new training programme, module four consisted of a 'mentoring' component, attended by senior and regional management and designed to address some of the frictions outlined above. It represented 'a really significant breakthrough with the LA project, and was aimed at regional level. We found that the attitude of supervisors at this level within the organization had a huge impact on the way that managers perceived LA' (manager, design and development team: Lending Advisor II, 1996).

One of the current Lending Advisor II team (1996) had been involved in the Mentor project training. 'The first few of these sessions had been terrible, then they gradually improved. The first sessions were noted for their extreme hostility from regional level staff and incredible arrogance toward the managers that were using the system. It now the most popular course that we run. The turning point for the LA project was this initiative within the regions. Risk teams had been told that they had to own Lending Advisor; it is not just a central initiative, and it is not something that just managers at branch and corporate centre level use. It is also theirs'.

Users/managers were further frustrated that, in addition to populating, learning and using Lending Advisor, they were told by the chief inspector's office, (head of UK Bank's audit department), that they also had to keep up the paper-based system of 'information cards'. The implication was that the UK Bank inspection teams (the head of an inspection team would be based at regional head office) were yet to be convinced that Lending Advisor was reliable enough to provide them with the kind of data that they needed, in order to assess risk management within a branch/business centre.

This was an issue that was brought to the attention of the Lending Advisor team during regional road shows undertaken by the head of UK risk management in 1996. 'It became apparent that the other significant obstacle to LA use was the inspections procedure....Changing the inspection department's attitude was a real challenge, but it
has been done and they are now called 'internal audits'. Managers have been told that
they have to present Lending Advisor at these audits in the future’ (assistant director,
Lending Advisor project, 1996).

Training alone could not change all this long-standing tradition. But, what remained
tended to be either gagged or shifted by an extensive program of early retirement
among senior management. This led to a dramatic demographic shift among upper-
middle management, and a noticeable shift in the attitude towards the assessment of
loans. One graduate manager, who had been promoted twice in the course of the
research study, made this comment: ‘In the bank today you are expected to go further
at a younger age, and there is definitely a demographic shift occurring within the
management of the bank’ (user/manager RL, 1995). In the second round of
interviews, many managers felt that lending was becoming more meter oriented and
that their expertise and experience counted for less and less. ‘When you talk to
analysts at regional level, they discuss cases more in terms of meters and [UK Bank]
business grades, nowadays’ (user/manager LL, 1996; user/manager RL, 1996).

4.9.4 The introduction of a new format for Lending Advisor cases

The Lending Advisor project team introduced a major change of its own during this
period. A new format for loading cases onto LA, known as Chapter 23, was
introduced. Whilst it helped by providing a template for Lending Advisor
applications and explaining the notion of application by bullet points further, many
managers were faced with the awful prospect of re-loading their cases. Chapter 23
rewarded those managers who had delayed loading their accounts onto Lending
Advisor, and was a slap in the face for those that had put in the long hours and done
what was asked of them. As one user/manager who had met the deadline for loading
cases onto LA put it: ‘Frankly, we got screwed on that one’ (user/manager IC, 1996).

The timing of Chapter 23, in the midst of the broader changes taking place in UK
Bank, could not have been worse from the point of view of morale. It engendered a
sense that the users'/managers’ efforts were not being valued by UK Bank
management. The managers voiced their frustration in interviews and a concern about
the future: why should they work hard on Lending Advisor? 'What if the bank decides to move the goal posts again?' (user/manager IC, 1996).

When asked about his changing use of the system and its functionality, in the second round of interviews, one manager said: 'There haven't been any significant improvements or enhancements, the system is still as bad as it was. This becomes more frustrating as you get more experienced with the system. The happier you are with the system, the more impatient you become that it can’t keep up with you. The technology in the bank is not yet in the 1990’s. For example, laptops, we really need them. When are they going to come?'

4.9.5 Delivery of laptops and system enhancements

The arrival of laptops had been delayed and delayed, before finally being cancelled altogether. To work on Lending Advisor meant working in the office. Managers had not only suffered through long hours during the initial backloading, they had now experienced re-loading with Chapter 23. When asked for the reason why portability hadn’t been delivered, a range of replies were received, spanning financial, budgetary, logistic and security reasons. These seemed to be based on rumour, guess-work or the word of the manager's regional LAM.

The Lending Advisor team had chronically underestimated the demand for portability among the managers. 'The issue of portability wasn’t really sufficiently brought to the attention of the senior members of the LA team until the corporate market programme road show when a senior IT manager toured the country asking questions. Managers took the opportunity to tell him loud and clear that portability was essential' (manager, design and development team: Lending Advisor II, 1996).

When the list of different theories for the non-arrival of laptops was read to senior members of the Lending Advisor team, one of them replied: 'Portability would only have cost around £1 million so money was not really the issue in a project of this magnitude. It was more that UK Bank had been wrong footed, wasn’t prepared for the portability needs of the managers....In the early days they had no idea of how to cope with the technical aspects of mass dial-up on remote machines or computer
security and it has taken some time to address these issues’ (assistant director, Lending Advisor project, 1996).

The local application managers were constantly having to address the issue of enhancements and portability with users/managers. A great deal had been promised to the users and it wasn't being delivered. The light at the end of the tunnel became ever more distant as far as the users were concerned, and many LAMs had to develop 'creative' narratives in an attempt to soothe away some of their frustration. The LAMs had to win the confidence of the Users whilst working with the Lending Advisor team and as a result, at times, had to wear a two-sided Janus face; putting on one face to represent the user to the Lending Advisor team; then having to wear the other in front of users/managers in order to follow out the LAM mandate from the Lending Advisor team.

The non-delivery of enhancements and portability had a significant impact on moral amongst the Users. ‘Expectations versus delivery had been a major issue and something that they [the Lending Advisor team] hadn’t managed very well. In the early days they didn’t understand the implications of making changes and enhancements to the system in response to feedback. Nor did they realise how long it would take to make these changes. They should never have promised if they couldn’t deliver. In some cases where they did act on feedback, it was feedback based on the early experience of managers and, as a result, they have ended up with a lot of junk on the system. They now have a considerable legacy and are not sure how they are going to address that issue. Should they just develop another system with more flexibility that takes into account the most recent feedback and experience of managers or should they attempt to do maintenance on the present system? Enhancements have now been delivered to managers so they now know that they can and will be done and hopefully have appreciated some of the difficulties encountered on the way’ (manager, design and development team: Lending Advisor II, 1996).
4.9.6 Unrealised time-savings

One of the expectations that was most mis-managed on the Lending Advisor project was the issue of time. The trainer on the Lending Advisor course told the managers: 'It should take about 45 minutes to do a risk assessment on Lending Advisor. It takes longer than 45 minutes to do a risk application using a form 21, therefore Lending Advisor should represent a considerable saving in time...eventually' (trainer 1, 1995). The second trainer on the course suggested: 'A full credit application should take a maximum of one hour' (trainer 2, 1995). It was suggested that time saved on the lending decision process could be spent marketing, developing new business, and visiting customers on site to improve their knowledge of the local business environment.

The data collected from users/managers was very different. On average, a straightforward Lending Advisor case would take a manager about 4-5 hours to load. A more complex case could take 15 hours plus, and involve eliciting further answers from customers needed for the Lending Advisor analysis, frequently data that clients were not used to giving to the bank. This figure per case varied slightly, from manager to manager, but did not change over the two and a half year period of study. Managers were not realising time savings.

Some local application managers responded to the issue better than others. 'Managers regard LA as a tremendous investment of their time at the moment. The project teams don’t realise the impact of this. Managers know that they won’t make this time up for another two years. LA is not a time saver, it is an enabler which allows the managers to look at the information in new ways. For example, they can manipulate the figures and ask questions like: what would happen if the customer didn’t hit their return by 1%?...There are benefits to LA, but time saving is not one of them. A year from now managers may be taking as long to use LA as they are now. But one year on they will have more information, better quality information and e-mail communication' (local application manager, Cambridge region, 1994).

In the early stages of the project, even after the estimated time-per-case figures had been challenged, managers were assured that time savings would be realised when
they reached the loan review process. ‘The comment on the Lending Advisor course that once the judgementals were loaded you wouldn’t have to alter them much, was blasé. I have not found this to be true. I have just reviewed a large account and it took me a whole day to update the judgementals. The review required another set of historical data and another set of projections. As far as I am concerned, Lending Advisor has not given time benefits the second time around during annual reviews and subsequent applications. They told us that it would. Since I have found this not to be true, I am concerned that Lending Advisor is not going to prove to be a significant improvement on the old system. Where is the promised time saving?’ (user/manager PL, 1995).

Managers had been led to expect considerable time savings when accounts came due for review; most of the managers found this was rarely the case. The Lending Advisor team had advised them to update the master copy of accounts as they went along, but none of the managers interviewed found this feasible. If the case had been well loaded on Lending Advisor, and it was a straightforward, stable business, the system would save time on reviews. In these cases, making a change, for example increasing the loan facilities, was much easier. In the past this would have involved re-typing the entire application. However, few accounts tended to be stable or straightforward; earlier cases were loaded with less experience, and perhaps before the introduction of the Chapter 23 format. Most managers doubted that time savings would ever be realised, particularly if the Lending Advisor team kept making changes.

Although time savings were not being realised, it appeared from the second round of interviews that managers/users were no longer working the long hours that they had been during the backloading phase of the project. They now spent more time ‘cold calling’ potential customers, and with marginal customers that they didn’t have time to concentrate on before. But, on average, managers were still spending about half their working day on LA.
4.10 Future

UK Bank continues to work on enhancements to the Lending Advisor system. A new generation of Lending Advisor, LAII, was in progress by the conclusion of this research study. Members of the LAII team said that the implementation of Lending Advisor had given them insights into the 'definition of need and roles within the bank'. Their aim was that the 'business should drive the next system, not the latest technology' (manager, design and development team, Lending Advisor II, 1996). The design and development team were focusing on 'strategically important aspects' of the new system. As part of this process, they were questioning 'whether the information generated by the original LA system was what the Bank really wants' (manager, design and development team, Lending Advisor II, 1996).

The new system would be 'owned' by UK Bank risk management, 'but paid for by the Business so, ultimately, it belongs to the business as a whole. It is going to represent the changes that [UK Bank] is making in the way that it measures risk. It is not sufficient to say that we have LA, and that this system alone is enough. Life is accelerating. Our competitors are also developing these systems and, as an organization, we have to constantly be striving to be better than the rest. We have to question how we are going to identify companies within the [UK Bank] Business Grades that will fail. We have to identify any items that might give early warning to defaults on loans. We are going to look at bank account behaviour, and use neural networks, to try and understand what the triggers are that lead to a default on a loan' (manager, design and development team: Lending Advisor II, 1996).

UK Bank is currently in the process of migration from Lending Advisor to the next system. ‘Our biggest challenge will be convincing managers that we are not moving on because we got it wrong first time around. We are moving on because this is the next evolution of the system’ (manager, design and development team, Lending Advisor II, 1996). The evolution of the Lending Advisor system was proving ‘difficult to explain to managers....the nature of this technology is that it moves on and the bank must move on with it. ...Managers think that now Lending Advisor has been implemented, that is it. That this was a one off effort and now things would settle down’ (manager, design and development team, Lending Advisor II).
There may be an even more profound shift in strategy in the future; for example, it was suggested that ‘lending is an expensive way of getting return to shareholders. Perhaps there would be other ways that UK Bank could provide greater profit?’ (assistant director, Lending Advisor project, 1996). The UK Bank IT consultants had already pointed to the value of the data being accumulated by Lending Advisor. With a portfolio representing 23% of the UK economy, UK Bank could harness this data and develop a range of information services. During a discussion with one of the trainers on the Lending Advisor residential course, we talked about the way in which Lending Advisor processes data from the customer and the manager’s ability to produce financial projections with that data. The trainer suggested that this was part of the strategy of the Bank, to rival to the role of an accountant.

Meanwhile, the managers are still assessing the impact of Lending Advisor on their working lives. One of the local application managers (1994) commented that: 'There has really been so much work getting the system in, getting the managers trained, and using it, that I don't think managers have had a chance to think about the implications of it for the future. They can all see the direction that banking is moving in though, they are not stupid'.

By the end of the study, managers seemed to feel divided between a sense of satisfaction that the old hierarchy was tumbling before their eyes, and anxiety about their role in the future. Those that remained, after the round of early retirements and redundancies, said that they accepted the changes. As one managers said, ‘All industries are experiencing this type of change and stress. It is just that the bank has not experienced it before. In the future, the job will be driven much more by profit, and not so much by status or grade. This is a good thing’ (user/manager LL, 1996).

It was not clear, however, who would be the beneficiaries of this 'good thing' and this new culture. Most managers expressed a degree of resignation: 'In the future, managers will have more work and less time to do it in with fewer secretaries and, perhaps, more support workers. Life will become more pressurised. The days of golf in the afternoons are long gone. If you go out to lunch with a customer it means you
have to stay late to catch up on the work that you would have been doing had you
have been in the office....Technology just makes those in work, work harder'
(user/manager SL, 1995).
Part Three

Analysis

Analysis in local context of organization
Lending Advisor in UK Bank: strategy formulation in practice

Strategic IS management
Issues for the design, implementation and management of DSS: the strategic positioning of DSS in the corporate skill set

Analysis in the global context of a 'risk culture'
Situated decision-making: DSS and the role of middle management. Implications for the transformation and generalisation of risk in a globalising society

Figure 5.0  The relationship between chapters in Part Three
Chapter Five

The emerging role of Lending Advisor in UK Bank

5.1 Introduction

This chapter represents the first part of the multi-level analysis discussed in Chapter Three. The relationship between the chapters in Part Three is shown above in Figure 5.0. This level of analysis focuses on the local context of Lending Advisor, and considers the consequences of using a specific kind of computer-based decision support in a particular organization.

Strategy was chosen as the main theme in this chapter, not because it provides a vehicle for a managerialist prescription or to lay blame on project members retrospectively, but because it emphasises some important issues and themes. Lending Advisor embodies some radical concepts, and was part of a process of transformation that presented UK Bank with some unique opportunities. The way in which Lending Advisor is managed on a day-to-day basis, and the strategic role that it is assigned within UK Bank will have significant influence on its outcome as a project.

This chapter is divided into six main sections. This first section introduces part three of the dissertation and outlines the structure of the chapter. The second section briefly reviews relevant strategy literature, and contends that it is dominated by a 'top-down' rational approach, which fosters many illusions, and does not inform us about how strategy emerges in practice.
In the following sub-section, the foundations for a re-conceptualisation of strategy are laid. In particular, the importance of everyday actions and language in enacting strategy are emphasised, and the reflexive relationship of individuals to their social, political and cultural context is discussed. It is suggested that this reflexive relationship, the routinisation of work, and Giddens' notions of discursive and practical consciousness, are all important to help us understand how decision-making is influenced by its context. In the next sub-section, Mintzberg's notion of deliberate and emergent strategy is introduced. This provides a useful way of conceptualising the obstacles encountered by the Lending Advisor team, the limitations of the Lending Advisor project, and the potential opportunities and risks that still lie ahead for UK Bank.

The third section considers the way in which the Lending Advisor project emerged from a 'vision' formulated by a group of middle management. It is suggested that the Lending Advisor case confirms the interpretation of strategy as emergent, contingent and constituted by actors throughout the organizational structure. The evolution of Lending Advisor's role is described, but it is suggested that this was not fully assimilated into corporate strategy. This had consequences for the way that the project could subsequently be managed.

The fourth section considers the way in which the Lending Advisor team responded to the deliberate and emergent issues on the project. Deliberate and intended issues are then explored in detail in section five, which is divided into three sub-sections. Section six is divided into four sub-sections which examine emergent and unintended issues on the Lending Advisor project.

5.2 A brief review of the strategy literature

The role of computer-based information systems in the mediation of work processes in organizations is of key concern to this thesis. Having originally been used primarily for data processing and administrative functions, information systems have been increasingly applied strategically (Ives and Learmonth 1984; Porter and Millar 1985; Earl 1988). One of the reasons that strategic planning began to be used in
information systems was the high failure rate of expensive projects in the 1980's and 1990's, as computer-based technologies mediated more and more key business processes. Its arrival also reflects a more widespread concern with strategic planning in organizations (Pettigrew 1987; Pettigrew and Whipp 1991; Pettigrew, Ferlie et al. 1992; Mintzberg 1994; Knights, Noble et al. 1997). Considerable attention was given in the literature, and among practitioners, to aligning information systems with business 'needs' in order to gain competitive advantage in the marketplace.

Most of the literature on organizational strategies, including information systems strategy, is 'rational, regards organizations as a unity with everyone working towards one aim, and sees strategy formation as logical, linear process' (Walsham 1993). This kind of literature can seem close to technological determinism, in the role that is ascribed to computer-based information and communication technologies. Organizations are seen to be no more than the planned outcome of rational decisions made by senior management (Knights, Noble et al. 1997).

The result of much of the strategy effort during the 1980's, was a proliferation of analytical tools and techniques, accompanied by exemplars of the strategic use of information systems. In this regard, the approach was consistent with the discourse on corporate strategy from which much of the impetus for an IT-strategy discourse emanated. The assumptions underlying such discourse are that problems can be analysed and broken down into their component parts, whereupon rational solutions are devised and imposed upon the organization through top-down executive decisions and imperatives' (Knights, Noble et al. 1997).

5.2.1 Some assumptions about strategy: enacting strategic concepts and strategic discourse

The concern of this thesis, and a growing literature in information systems research, is how strategy forms in practice; this perspective views the whole concept of organization as problematic, and strategy formulation as a dynamic socio-political process within multi-level contexts (Ciborra 1991; Orlikowski and Tyre 1993; Walsham 1993; Ciborra and Jelassi 1994; Orlikowski 1996; Orlikowski, Walsham et al. 1996; Knights, Noble et al. 1997). Before identifying key themes from the strategy
literature that will be examined in this chapter, some assumptions about how strategy is communicated and embedded in organizations will be explored. The IS strategist will be presented as an *enactor of meaning* through the discourse on IS strategy (Smircich and Stubbart 1985; Walsham 1993). '[T]he task of the strategist is to contribute to 'organization making', the creation and maintenance of systems of shared meaning that facilitate organized action. The IS strategist is an agent of organizational change through the medium of language. Choice of vocabulary implying particular enactments of the organization and its environment is a key element of the role of the strategist' (Walsham 1993).

The nature of the strategic discourse employed, and the narratives that are constructed during a project, can have a significant impact on that project. Further, there are certain events in the project process which, as will be discussed later in the chapter, are particularly important in this respect, for example training. A certain amount of specific effort may be made for 'front stage events'; however, of critical importance also, is the choice of *everyday vocabulary*, which is likely to reflect tacit assumptions on the part of the stakeholders, about the project's goals and their relationship to them. A hollow, chant of rhetoric which does not translate into action, will not suffice if lasting change is to be brought about.

The work of Smircich and Stubbart (1985) and Walsham (1993) plays a valuable role in raising our awareness about the role of strategic discourse, but we also need to emphasise the importance of everyday, routine actions as a medium for the enactment of strategy. Giddens (1984) suggests that an inherent aspect of being human is the capacity to understand what we do, as we do it. We do not break off from our context as we go about our work processes; we are involved in it, and it has an influence on us. To a certain extent, we are able to discuss what we do, and why we do it, and Giddens calls this our 'discursive consciousness'. However, for the most part our 'knowledgeability' as agents is largely carried in 'practical consciousness'. 'Practical consciousness consists of all the things which actors know tacitly about how to 'go on' in the contexts of social life without being able to give them direct discursive expression'(Giddens 1984).
Common sense tells us that our everyday routine actions are based upon sets of values, goals and certain ways of seeing the world. Hermeneutic theory suggests that these are based upon a predominantly implicit, individual interpretation of past experience, present understanding of our context and a projection of likely futures (Gadamer 1975). This process is heavily dependent on context, including the constant interactions that we have with individuals and groups around us. During these interactions, acted responses, use of symbols and language all contribute to the way in which our view of the world is sustained or changed.

It is suggested that strategy is similarly constructed, deconstructed and embodied in situated, everyday interactions, symbols and language; it is not an 'out there' issue, as implied by so much of the strategy literature. 'Lived strategy' is much more dynamic than the prescriptive, rational theoretical models that dominate the field. Taking a hermeneutic view once again, strategy could be interpreted as a 'kareoke', with the project stakeholders providing the 'backing track' to a kaleidoscope of different, individual performances. To deepen the effectiveness of a project like Lending Advisor, the 'backing track', or underlying concepts, have to be embedded in the consciousness of those in the organization throughout the project.

When attempting to bring about change in managers' everyday work practices, on the kind of scale that the Lending Advisor team were, it is crucial that those individuals receive confirmation of the meaning of that strategy from multiple levels within the organization. For example, they need to understand the importance of the project for the organization from executive management, to have their use of the system reinforced by layers of management above and around them, and to hear conviction in the voices of their peers, if they are going to routinise everyday use of the information system and work with that strategic vision.

5.2.2 Mintzberg: deliberate and emergent strategy

We draw, here, on the work of Henry Mintzberg (1978, 1985, 1985, 1994) and in particular, on Mintzberg and Water's (1985) notion of deliberate and emergent strategy. Mintzberg coined the term 'strategy formation' to communicate what he perceived to be the emergent nature of the strategy process: ‘...the usual definition of
'strategy' encourages the notion that strategies, as we recognize them ex post facto, are deliberate plans conceived in advance of the making of specific decisions' (Mintzberg 1978). He defined strategy as a 'pattern in a stream of decisions and action' (Mintzberg and McHugh 1985). This definition aims to distinguish between decisions which represent intentions, and action which represents realized activity. This distinction forms the focus of much of Mintzberg's extensive, case study based research which explores strategies that were intended and those that were realized despite intentions.

Mintzberg and Waters (1985) suggest that strategy formation 'walks on two feet, one deliberate, the other emergent....managing requires a light deft touch - to direct in order to realize intentions while at the same time responding to an unfolding pattern of action' (Mintzberg and Waters 1985). This provides a useful way of conceptualising the obstacles encountered by the Lending Advisor team, the limitations of the Lending Advisor project, and the potential opportunities and risks that still lie ahead for UK Bank.

Mintzberg and Water's work helps us consider the perceived distance between planned strategy theory and lived experience, as a creative opportunity for learning and change (Quinn 1980; Mintzberg and Waters 1985; Orlikowski and Tyre 1993; Orlikowski 1996; Orlikowski, Walsham et al. 1996). However the gap, or time lag, between high level corporate strategy and everyday practice can also generate confusion, and add to the perceived riskiness of a project in the working lives of individuals and groups within the organization. If one is going to 'walk on two feet', balance is essential. A certain degree of interplay between deliberate and emergent strategy may be creative; indeed, can make the organization dance, but a lack of insight and extended gaps of time between the shift from one foot to the other, can cause it to stumble.

The following section explores the notion of strategy formulation, by considering the way in which the Lending Advisor project was initiated, and its changing strategic status within the organization.
5.3 Formulation of the Lending Advisor 'vision' by the business team

The chronology of the research interviews, and varying expressions of strategic interest or intent by the different stakeholders in the Lending Advisor project, provided considerable insight into the formulation of strategy. In the early stages of the research, statements of intent were gathered from senior Lending Advisor team members, representing it as UK Bank's response to both the 1992 losses, and to subsequent shareholder anxiety about those losses. This seemed to suggest that Lending Advisor was the result of a deliberate corporate strategy that was being implemented 'top down'. However, as will be illustrated with material from the case study, it became apparent over time that this was not so, and that Lending Advisor had in fact emerged from a 'vision' held by a group of upper/middle managers.

One of the first interviews conducted in the case study was with the original project manager. He described Lending Advisor as a 'Trojan Horse...a vehicle for change that will bring down the old hierarchical, family-based structure and pave the way for a lean, flat organizational structure with one-stop [loan] sanctioning' (1994). Subsequent interviews with the users/managers indicated that a number of basic project goals had been very effectively communicated to them, for example consistency in loans procedures, but no formal knowledge of any broader strategic consequences.

Almost a year later, the 'Trojan Horse' role of Lending Advisor was raised in an interview with the second Lending Advisor manager who abruptly countered: 'All Lending Advisor has ever been is a software application.' She broke the ensuing silence by saying: 'In an ideal world you would develop an information system by identifying a business need - a problem. Then, you would gather together your business and technical experts and come up with a solution which you would then design and implement in a series of stages. Lending Advisor was never like that. As soon as the business need had been identified, Lending Advisor raised serious issues'. Why was there this gaping hole in their strategy? What was needed to fill it? Lending Advisor brought up issues along the way which made its development very distinctive' (project manager, Lending Advisor team, 1995).
The sudden underplay of Lending Advisor's strategic role in the corporate vision, and oblique references to 'gaps' in UK Bank's strategy, were a little confusing. However, it was surmised, time had moved on and with it, perhaps, the enthusiasm of the original Lending Advisor team. It was not until much later, when an opportunity arose to interview the ex-project director, that the contradictions in these two statements were put into context: 'LA emerged out of an initiative led by a functional line, not a corporate line - a functional line. We didn't know that LA would lead to a flat [organizational] structure. The world was changing around us and we knew that, but a lot of the consequences of LA are a 'chicken and egg' situation. LA enabled the bank to make changes. It enabled the flat structure, but the flat structure was not part of the original project. Once the other functional lines began to recognise the potential opportunities presented by LA they began to structure changes around it' (director of the LA design and development team, 1996).

When the strategic nature of Lending Advisor was pursued further, the director interjected: 'I want to emphasise to you that the long term implications and consequences of LA were not really apparent at that point. LA had dropped into my lap by accident. I recognised the profundity of it, and the idea that it could lead to strategic changes. However, these were regarded as potential opportunities at that point, rather than a deliberate programme of change’ (director of the LA design and development team, 1996).

The Lending Advisor case would seem to defy the rational notion of strategy that has dominated the literature. Strategy has traditionally carried with it the 'laudatory associations' of strategic thinking, which reflect the great prestige of 'strategic' management thinking generally, due to its associations with higher levels of thought and the most senior executive management' (Knights, Noble et al. 1997). Much of the managerialist strategy literature is based upon the assumption that a vision of the future is planned among top executives at board level, even if the detailed implementation is worked out by people further down the organization. Ideas are passed up, agreed and then implemented downwards. In contrast, the Lending Advisor case confirms the interpretation of strategy as emergent, contingent and
constituted by actors throughout the organizational structure (Ciborra 1991; Orlikowski 1996; Knights, Noble et al. 1997).

In some ways Lending Advisor was imposed on its users. Very few users were consulted during the development phase; it was implemented quickly without consultation, accompanied by urgent, survival rhetoric. But it would be wrong to leave the Lending Advisor case with the impression that this was a text book 'top down' strategy. It is the level at which the Lending Advisor 'vision' emerged that is crucial, if one hopes to understand the limitations of the Lending Advisor project, and the potential opportunities and risks that still lie ahead for UK Bank.

The emergence of the Lending Advisor 'vision' would seem to confirm Ciborra's (1991, 1994) notion of diffuse strategy formulation. The Lending Advisor project team were, for the most part, line managers from branches and business centres around the country. Led by the director, the Lending Advisor 'vision' was built up from these manager's cumulative reflections, and practical daily 'know how' about UK Bank processes, rather than from top-down corporate analysis and planning. As such it is an interesting example of Ciborra's (1994) notion of 'bricolage'; the value of which is to keep the development of a strategic information system close to the competencies of the organization and its ongoing fluctuations in local practice (Ciborra and Jelassi 1994).

Walsham's definition of an IS strategist, is most appropriate here: 'An IS strategist can be thought of as anyone who takes part in the discourse of IS strategy at any level. Of course, existing power relations will condition the influence of any particular individual's ideas. This need not be restricted to top management although the "enlargement of the constituency" of IS strategists is not intended to suggest a diminished importance for leadership' (Walsham 1993).

Walsham's emphasis on the need for leadership will become more and more relevant as this chapter progresses. In the following sections, the efforts of the original project team to communicate and embed their strategic 'vision' will be examined. It will be suggested that they did so, with varying degrees of success, at certain levels within the
organization, but encountered a significant challenge when it came to the corporate level - one that they decided to back away from.

5.4 Managing deliberate and emergent issues on the Lending Advisor project

The original project team generated and developed a strategic 'vision' of Lending Advisor's role, and the changes that it could potentially enable. However, identifying the emergent and deliberate aspects in this project is problematic. This is partly because the Lending Advisor team were not in a position to transform this potential into a deliberate corporate strategy. In order to secure funding at corporate level, it had been sold as a straightforward initiative to improve portfolio management and reduce 'bad and doubtful debts' in certain markets; although their original vision had encompassed much more. The project's status was further complicated because it began to be of interest to other parts of the organization, who wanted to use it as a vehicle to realise some of their own aims. As the project director said, they were unsure what the consequences of this modified and expanded system might be.

In some respects the whole of the Lending Advisor project represents emergent change; it was not the result of deliberate analysis and planning by executive management. However, within the team, certain stable principles, goals and aims were established around which the Lending Advisor system was developed. It is, therefore, a matter of which point in time one chooses to assess the project effort. In the absence of a planned corporate strategy that encompassed the growing potential of the Lending Advisor technology, the team pursued tactics to achieve these stable targets. The Lending Advisor team channelled their efforts into aspects of the project within their sphere of influence in the organization.

Although they cannot be neatly divided into deliberate and emergent strategy, one can identify areas where the project team intended certain outcomes and anticipated certain issues. As the project progressed, some of the intended outcomes, like time-savings on Lending Advisor, raised unanticipated issues. Portability, another intended outcome, was confounded by a lack of high level corporate strategy. Further issues emerged, such as typing and supervision, that were unanticipated and sometimes led
to unintended outcomes. As will be seen later in the chapter, these unanticipated issues were responded to with different degrees of timeliness and effectiveness.

During interviews, members of the original project team conveyed considerable conviction and enthusiasm accompanied by a high degree of personal involvement. They were a small team, and managed the project process quite closely, putting particular effort into ensuring that the project vision was communicated at certain strategic points. For example, particular effort was focused on the customization and development phase, and early implementation, when it was important to 'sell' Lending Advisor to its users and UK Bank stakeholders.

5.5 The deliberate and intended

This section explores in detail the deliberate and intended issues on the Lending Advisor project. It is divided into three sub-sections. The first sub-section reflects on the management of relations and communications between the Lending Advisor team and the IT department. The second sub-section considers the management of expectations by the Lending Advisor team and the use of 'figureheads' to promote the 'Lending Advisor message'. The third sub-section details the Lending Advisor team's tactic of using highly respected colleagues and peers to 'sell' Lending Advisor to loans managers.

5.5.1 Managing the relationship with the IT department

A frequent complaint by project teams, explored in the IS literature, is the way that IT departments confound or 'lose' projects in development, so that the final product does not meet business 'needs'. This is often attributed to a 'culture gap' between the members of the IT dept. and the business that presents communication difficulties between the two sides. The Lending Advisor team were aware that they faced a particular challenge since, after an initial period of technological 'trail blazing' in the 1950's and 1960's, UK Bank's management services (IT dept.) had developed a stereotypically negative reputation.

Historically, attempts to address this by seconding lending managers to management services only served to compound the situation. This was partly because, when the
seconded managers returned, they were be considered to be out of touch with the business, and would have to re-join line banking at the same, or lower, grade than when they left. As a result, senior managers tended to offer their worst loans managers for secondment rather than hold back the career of a promising manager, whose ascension would then follow the predefined path trodden by generations of loans managers before him/her, minus any such blemishes or interruptions.

Further fuel for the 'culture gap' image was the independent, geographical location of management services in the north west of England. The Lending Advisor project director determined that a hands-on approach was needed and, during the customization and development phases, he would book into a local hotel, so that he could oversee and contribute to the process. Both the project director and the project manager were charismatic individuals with good reputations within UK Bank. They maintained a personal presence in management services, sometimes for over a month at a time in the early phases of the project. The project manager also chose the line managers who would be seconded onto the project, and watched over their progress in management services. Engine Inc. consultants moved into the management services buildings and were given their own desks among the UK Bank team.

It is worth noting that, in interviews conducted during later stages of the project, after many of the original team members had moved on, tensions between the business team and management services began to resurface. Both sides seemed to lapse back into the familiar, negative stereotype. Management services complained that the business didn't know what they wanted, and the business team maintained that the 'techies' would throw jargon at them to avoid doing what they asked.

During these later interviews, many of the business team members insisted that management services lived in a 'different world', far from the intensity and pace of business in London. They said that they objected to getting up at 5am to catch a train to the north west of England, only to be kept waiting during the day while members of management services went to eat lunch with friends. Management services was situated on a 'campus style' site, built with low inter-connected buildings; this led
some members of the business team to call it 'Waco' as a way of characterising its perceived bid for independence from them.

5.5.2 Figureheads: managing stakeholder expectations in the early project stages

The Lending Advisor team knew that widespread acceptance of the system would be necessary if it was going to be effective, and that this would be a challenge, as it would entail a radical shift in culture and skills. On the assumption that 'only certain people, can deliver certain messages', they began to pursue deliberate policies of using figureheads, from various levels within the organization, as well as the users/managers peers to sell the system (project director, 1996). The project director emphasised that the strength of the Lending Advisor project was to have 'champions' at various levels: executive management, project management and among the users' peers. He said that, in this way, 'we managed to stay ahead of the grapevine most of the time so that overblown rumours were avoided' (1996).

Senior members of the project team carefully chose charismatic, high profile champions and persuaded them to give their time, and a positive attitude, to the project. The team members remarked upon the general lack of IT knowledge and skills at executive level within UK Bank. However, in interviews, they maintained that this did not prove to be an obstacle for their purposes at this stage, as they just 'programmed' them to broadcast Lending Advisor rhetoric (assistant project director, 1995).

The users were not the only project stakeholders that concerned the project team. Also of major concern were the shareholders, who were very anxious after the major losses. The rating agencies together with the Bank of England were calling for better portfolio management throughout the industry. As the Lending Advisor project gained pace, top executives within UK Bank quickly constructed a narrative for its shareholders, and the public, which assured them that this new organizational form had been 'driven' through by a leading edge technology - all part of their response to the losses that had been sustained. They reconstructed events to give the history of Lending Advisor a coherence and strategic determination that had never been there.
The project director personally opened every training session for users/managers, and returned to host the end of training dinner. This gave him an opportunity to reinforce the necessity for users/managers to accept the system: 'We approached it from the angle that tomorrow will be better than today - and today is not acceptable' (1996). The team did not have to sell the fact that 'today was bad'; the country was experiencing a recession, many of the managers had been individually blamed for incurring certain losses: 'When they lost good customers, they very often lost good friends in the process. These were people that they had invited to their houses for dinner, had played golf with, and established good friendly and working relationships with. When these managers walk into a pub now, working for a bank is regarded as a negative. People turn around to them and ask, "Why did you let us do this, why didn't you warn us that things could go this wrong"' (1996).

Managers were told that they needed to change working practices to ensure that another major loss was not sustained by UK Bank. Pointing to the current business environment was part of establishing a 'perceived need for change', after which they would shift emphasis to address the fears of 'tomorrow', all of which made the introduction of Lending Advisor seem 'inevitable'

What strikes one most about the discourse used by the Lending Advisor team is the emphasis on survival, and the assertion that there was 'no choice' but to accept Lending Advisor. The director maintained that a 'burning platform is a great ally for a change agent', and among the Lending Advisor team, he frequently described the introduction of Lending Advisor in UK Bank as 'using a crowbar to open a fan light'. The director seemed aware that this metaphor was aggressive, if not brutal; indeed he described some team members' reservations about it. One of his key concerns was to force a break with the past, and set new organizational precedents, primarily the use of computer-based information systems by middle management.

Did the Lending Advisor team do this as a tactic, to gain 'acceptance' of the system because they didn't have corporate legitimacy, or was it just part of a style that is being adopted more broadly in a business community feeling the competitive
pressures of a globalising marketplace? Are these echoes of Fordist bully boy tactics, updated for the 1990's, that use a Taylorist hammer of scientific legitimacy to say: "this is progress, this is science, and therefore it is right and beyond a layperson's questioning"? Were the intermittent affirmations of the superiority of expertise of human agents just a veneer of humanity, on a project whose aim was to use a highly rational tool to rationalise?

In a press release to announce the implementation of Lending Advisor, after a long period of secrecy while it was developed, the chief executive officer (CEO) was quoted as saying: 'Automated credit rating is more effective than the judgement of Bank staff - and certainly cheaper...Traditional branch managers, who needs them?' (4th June, 1995). The comments by the CEO that appeared in the media would certainly seemed to be at odds with the soothing narratives simultaneously emanating from the local application managers in interviews being conducted at the time. But which interpretation would come to dominate?

5.5.3 Lending Advisor: sold and supported by peers

One of the convictions of the project team was that Lending Advisor needed to be sold by peers. Local application managers were chosen from each region, and product champions elected in each branch/business centre. This created a 'buddy network' of peers, who would help colleagues cope through the difficult transition, and help address technophobia where necessary.

The influence of the local application manager (LAM) on the implementation process in the regions was considerable. In both the London central and the Cambridge regions, in the comparative study the LAM had been particularly effective. The first London central LAM was closely involved in the evolution of the training courses, and sustained a high profile with the users/managers in his region. He encouraged them to get involved in the design sessions for future training modules, and would work with them one-to-one in their offices to help develop their own use of Lending Advisor. Working with the LAM meant that private technological fumbles remained private, while contributing to the roll out of the training modules fostered ownership and commitment to the system.
The local application manager for the Cambridge region had 'vigorously communicated his manager's feedback to the LA Business team and made himself very unpopular with the business team' (assistant director of the Lending Advisor project, 1996). However, as the project team went around and talked to managers within his region, it became apparent that he was 'regarded very highly by them' (assistant director of the Lending Advisor project, 1996). The local users/managers saw him as their 'champion' in the face of imposed change.

This was a great advantage in the Cambridge region which had been a potentially problematic community for the introduction of Lending Advisor, due to a perception that they had a high proportion of specialised accounts (agriculture, property, biotech). Many local managers had been involved in financing the small businesses in a science park venture established on the outskirts of Cambridge by Trinity College, which had proved highly successful, earning the nickname 'Silicon Fen'. These users/managers knew that getting loans sanctioned for these research and development based businesses, using Lending Advisor in the future, may prove doubtful. The LAM was key in communicating their reservations to the Lending Advisor team. Users/managers in the Cambridge area tended to identify more closely with their local environment, whereas Central London exerted its cosmopolitan effect on managers and customers alike, with the result that they tended to accept the presence of the system, although not perhaps all the claims for its capability.

Several comments were made during interviews about the 'Janus head' of the LAMs, and the problem of working out what their status was on the project. An interesting consequence of interviewing so widely was that one would notice when narratives were constructed in order to soothe or fill a communications gap between the users/managers and the project team until a response had been formulated. As will be shown in the following sections, this was certainly the case with many of the emergent issues on the project, for example time-savings and laptops.
5.6 The emergent and the unintended

Having reviewed the deliberate and intended issues on the Lending Advisor project we now move on to consider those emergent issues that were not anticipated. This section reflects on the management of these issues by the Lending Advisor team. It is divided into four sub-sections. The first sub-section addresses un-realised time savings, which the field data showed to be one of the most important issues for users/managers. The second sub-section discusses the related issue of portability; the lack of laptops meant that users/managers were tied to their desk and could not choose when or where to work on Lending Advisor. The third sub-section explores some of the obstacles that hindered day-to-day use of Lending Advisor and the critical impact of day-to-day management and supervision. The fourth sub-section concludes the chapter with a discussion of keyboard skills and the resourcing of administrative support for users/managers. This highlights the programmes of organizational change occurring during the later stages of Lending Advisor implementation and a shift in the corporate skill set which are explored further in Chapter Six.

5.6.1 Time-saving?

One of the major goals of the Lending Advisor project was time-savings on loan processing. This emerged as the team’s most profound misrepresentation to its users during implementation. The Lending Advisor team led users/managers to believe that this was an achievable goal in the medium term. The ex-Director of the Lending Advisor project insisted that: ‘Once managers are over the hump of loading LA the will see that it saves them time. This will be the biggest challenge to them. They will be required to use this spare time in improving and understanding their customer’s business. They will need to concentrate on improving their grading of new business. Now this will be a challenge’ (his emphasis, 1995).

As the research continued, it revealed a considerable, and persistent, difference in perception between the Lending Advisor team and users/managers on this issue. A knowledge engineer, interviewed in May, 1994, who was working on the Lending Advisor pilot, anticipated that it would take users/managers ‘three hours to load a case as the basic data had been entered centrally for them. Once the data has been put on, it is there continually. When reviews come around, therefore, it would only take them
around half an hour to get a full set of accounts, and advice on the overall suitability of that business.

During a residential introductory course in 1995, a trainer was asked how long it would take to assess a loan using Lending Advisor: ‘It should take about 45 mins to do a risk assessment on Lending Advisor. It takes longer than 45 minutes to do an advances application using a form ‘21’, therefore Lending Advisor should represent a considerable saving in time...eventually.’ Later that day, a different trainer was asked the same question and he replied: ‘A full credit application should take a maximum of one hour’.

Even if one regards the testimony of users/managers during the first round of interviews in 1995 as being unrepresentative, because they were still learning hardware and software skills, the data collected in subsequent interviews during 1996 and 1997 contradicts the above statements by members of the Lending Advisor team. After one year’s Lending Advisor experience, there was a consensus among managers that ‘straightforward, run-of-the-mill’ cases typically took eight to ten hours for a user/manager to load, with complex cases taking twenty hours or more. In the second round of interviews, much to the frustration the users/managers, this figure did not seem to have diminished.

The issue of time, tended to be better understood by those working more closely with users/managers in their everyday work practices. The Cambridge region LAM (1994) framed the issue quite differently: ‘Managers regard LA as a tremendous investment of their time at the moment. The project teams don’t realise the impact of this. Managers know that they won’t make this time up for another two years. LA is not a time saver, it is an enabler which allows the manager to look at the information in new ways. For example, they can manipulate the figures and ask questions like: what would happen if the customer didn’t hit their return by 1%? There are benefits to LA, but time saving is not one of them. A year from now the managers may be taking as long to use LA as they are now. But one year on, they will have more information, better quality information and e-mail communication. It is not a short term payback,
in terms of their effort. At the moment the manager has only experienced the extra work that LA creates. There has not been enough time to see the payback yet.

This question of when they would experience a perceived 'payback' for their efforts proved to be an emotive one for users/managers. Whilst they understood that this might not be apparent in initial applications on Lending Advisor, most had been led to expect time-savings when it came to annual reviews. The impression in many interviews was that these anticipated time-savings at review time were the 'light at the end of the tunnel' for many managers. However, when re-interviewed, most of those same managers said that, so much had changed in the course of a year they had to re-write the Lending Advisor case anyway. The anticipated timesavings were not realised, which effected morale.

The Lending Advisor team's early response to the issue of time-saving did nothing to buoy up that moral. They would imply that the manager in question was not working efficiently, and had not discovered how to use Lending Advisor effectively yet. For example, when this research data was presented to the assistant director of Lending Advisor (1995), he paused, and then said: 'I have found a big difference between well organized managers and chaotic reactive managers. I have sympathy for the latter, since I have a tendency that way myself. I have found a north/south divide with respect to this. Further north they tend to have absorbed LA into their working day a lot better. For those who are not so well organized, the paper-based system is more flexible. A '21' is more flexible to them, and LA will be a problem with respect to time'. For managers, it was a trying time; the Lending Advisor team kept putting the ball back in their court.

This situation was exacerbated by an attempt by the Lending Advisor team to discipline the users/managers into efficient work practices, by introducing a new format for Lending Advisor cases, one year after implementation. As mention in Chapter Four, it was called 'chapter 23', and focused on bullet point applications structured according to a template which was laminated, and set next to each user's/manager's network computer.
As a consequence, users/managers had to go through their entire portfolio to make it conform to the new format, and in many cases re-load. This had the ironic effect of ‘punishing’ those who had worked long hours to meet regional deadlines, and giving those who had been slow to respond yet more reason to regard the others’ efforts cynically. Further, it gave the users/managers the impression that the Lending Advisor team had not appreciated their efforts thus far, and fuelled rumours that subsequent versions of Lending Advisor would require managers to re-load all over again. The Lending Advisor team may have been learning, but so far it was at the expense of the users/managers.

The suggestion that a ‘well organised’ manager would experience time-savings was a view that appeared to have been superseded by the time the current director of Lending Advisor was interviewed in November, 1996. He maintained that the anticipated time-savings had not been realised because user/managers had, firstly, been required to keep up a parallel paper-based systems during implementation and early business-as-usual status and, secondly, not received sufficient administrative support. He suggested that these issues were being addressed by the current corporate market program.

The long hours that users/managers worked at Lending Advisor, which senior management attempt to explain, or wish away, in the above narratives, inevitably meant that they had less time for other essential tasks. This hidden cost of Lending Advisor implementation is hard to quantify, but it was felt acutely by users/managers whose performance-related pay began to reflect their stunted interaction with new clients.

5.6.2 Portability

The issue of time-savings might not have been felt so severely had users/managers been provided with laptops. Early training was conducted on Windows-based laptops, and the advent of portability had been strongly emphasised by trainers, which created false expectations among the managers. Much to the frustration of users/managers, the time frame for the delivery of laptops was repeatedly delayed until, it seemed, the whole initiative was cancelled.
The lack of portability must rank among the highest hidden opportunity costs of the Lending Advisor project. Among the benefits and features of Lending Advisor outlined in a UK Bank employee newsletter in March, 1994, is one stating that, it ‘allows more time to be spent on other important functions, such as business development and sales management’. Opportunities to develop business were lost, since managers were tied to their desk, particularly during the loading phase. The research showed that this was hardest on central London commuters, who didn’t have the option of ‘popping into their local office’. They had to endure early starts to their day and slow, late night and weekend trains. It is difficult to evaluate how much potential business was lost because of long hours, and restricted access.

It was not just business opportunities that were lost. The availability of Lending Advisor was restricted to office hours, early evenings and between 10am and 4pm on weekends. The latter was regarded as prime family time by the majority of users/managers. During his first year of Lending Advisor use, one manager noted quietly that he had not seen his six month old, baby girl put to bed since the first week that she was born. The Lending Advisor team did not think through the long term impact that this would have on the users/managers, or how it would influence their response to Lending Advisor.

During the second round of interviews, users/managers taking part in the comparative study were asked to rank, in order of ‘need’, the provision of a Windows-based interface, property and agriculture modules or portability. All forty asked for portability as a matter of urgency, closely followed by a Windows interface, and showed little enthusiasm for the new modules which were still languishing in an expensive development process.

When the clamour for laptops was feedback to the project director, he expressed surprise. He had expected the concept of a ‘mobile manager’ to be hard to ‘sell’. Contrary to the director’s expectations, the research study showed most of the managers interviewed were very keen to become ‘mobile managers’. They resented
the fact that Lending Advisor kept them tied to their desks, and said that they much preferred being out and meeting customers on their 'own territory'.

The issue of laptops represents a lost opportunity for embedding the positive aspects of introducing computer-based technologies. It was becoming apparent to managers that the introduction of Lending Advisor coincided with the demise of the 'local bank manager' concept. Lending Advisor could have simultaneously been promoted as emancipatory, heralding new opportunities for flexible working practices that would free users/managers from their offices. Portability could have significantly influenced managers attitude towards both Lending Advisor, and more generally about using computers in their job. If user/managers could have chosen their own time and place to work on Lending Advisor, they may have explored and 'played' with the system. Indeed, this has been found to be an important and effective way of learning new technologies (Webster and Martocchio 1992).

During a project review, after many of the original Lending Advisor team had moved on, the introduction of laptops was cancelled. When news of this decision spread, it had an extremely negative effect on morale. Again, it was interesting to note the various narratives fed to the users/managers to account for the cancellation of laptops: reductions in the budget, security of data and hardware, the logistics of providing home and mobile telecommunication links. The most pervasive narrative by far was that it was due to cuts in the Lending Advisor budget.

The current Lending Advisor director (1996) estimated that portability would only have cost around £1 million, which 'on a project of this magnitude is not a real issue'. Instead he suggested that the Lending Advisor team had been confounded by a lack of corporate strategy. Why were laptops not made available? 'This was largely due to the absence of a strategy for portability within the bank. How much processing power would be needed on the laptop? How much and what kind of access should be available? What about security issues? The problem with laptops was, that once one person had one, ten thousand wanted one. We were wrong-footed by portability. Portability, especially 'dial-up', was not well tested at these kinds of volumes, and we were unprepared' (director of the LA design and development team, 1996).
One of the project team's initiatives was a series of 'road shows', where key members of the team would tour the country listening to feedback from users/managers. These proved to be a useful communication channel, and it was during a road show tour with the head of IT, straight after the cancellation of laptops was announced, that users/managers got their message across loud and clear: laptops were not a luxury, they were a necessary source of support for their new working practices, and were urgently needed.

By November, 1996, UK Bank was piloting a portability project which they hoped to scale to the entire domestic network. However, the project team were discussing restricting access and functionality on laptops, so that users/managers didn't 'waste time' by using it for anything else, other than Lending Advisor. They did not recognise it as an valuable opportunity to encourage users/managers to organically extend their IT skills and experience, by allowing them to explore, for example, organizer programmes or the internet.

5.6.3 Supervision and day-to-day management of Lending Advisor

The attitude of supervisors at regional and senior levels within branches/business centres was found to have a considerable impact on the way that the users/managers responded to the technology. About one year into the implementation process, the Lending Advisor team discovered that, whilst regional offices were paying lip service to Lending Advisor, unofficially they regarded it as a poor substitute for their professional expertise. Further, they perceived Lending Advisor as a threat, a concern that was not unfounded since, although the technology itself may not have been, the organizational changes that seemed to accompany it certainly were, and de-layering initiatives were in progress.

The Lending Advisor team found that regional risk directors were sanctioning loans 'on the basis of printed off LA comments, the cash flow figures and the fact that they knew the customer' (manager, design and development team, Lending Advisor II, 1996). It was also realised that senior branch/business centre managers, were operating traditional, paper-based loans processes for amounts within the
branches/business centres discretion. 'In-house' they privately kept the familiar, more expedient, paper-based system running while anything that had to be seen by 'outsider's eyes' would be committed to Lending Advisor.

Once the Lending Advisor team realised that senior branch/business centre managers were stunting the use of Lending Advisor, it became policy for all loans to be processed on Lending Advisor (not just those that had to be sent to be sanctioned at regional level); and a series of modular courses were developed, called the mentor project. The first sessions of the mentor project were noted, by those running the training programme, for the extreme hostility from regional level staff and 'incredible arrogance towards the managers that were using the system' (manager, design and development of Lending Advisor II, 1996). In an interview, in 1996, he claimed that it was now the 'most popular course that we run'. The consensus, among the 1996 Lending Advisor team, was that this initiative within the regions had been the turning point for the Lending Advisor project. From then on, it was presented as not just something that branch/business centre managers used, regional management had to own it as theirs as well.

There was, however, a further source of sabotage in the form of a dictat from the UK Bank inspections department, which insisted that users/managers maintain key paper-based records, concurrently with Lending Advisor. The inference was that for the purposes of inspections, there must be continuous access to reliable data, and that they were as yet unconvinced by Lending Advisor. This, of course, added a considerable burden onto the user/manager, who had to update two different systems. Once this came to the attention of the Lending Advisor team, it was the turn of the inspections department to experience process re-design and organizational change. It was renamed 'the audit section', and all its managers trained to conduct their work via Lending Advisor.

In some senses, the Lending Advisor team had anticipated issues of this nature. They knew that the culture shift, accompanying the organizational changes in UK Bank, were likely to result in some 'hot spots'. Having been present while one of the mentor courses was being run, it was not apparent that they were quite the 'popular', and
docile event, so hopefully described by the Lending Advisor II team manager above. However, the mentor initiative was a considered response, and one that seemed to be timely.

How Lending Advisor is managed on a ‘business as usual’ level by supervisors and senior managers will have a considerable impact on the culture within UK Bank. It is this internal environment, and interpretation of LA’s role, that will define the effect that it will have both on everyday lending practices, and the future direction of UK Bank. One of the critical levels, at which this re-orientation has to occur, is at the supervisory level where day-to-day practices and attitudes are rewarded or discouraged.

‘People respond in the way in which an organization trains them to respond. ... One of the most important aspects of this process, was the way in which the use of those tools and devices were rewarded or punished. An organization can announce a strategy, but it is how the supervisors implement it lower down the organization that will decide whether the ethos will be one of creativity, or control. It is this that either stunts, or encourages, creative behaviour. This has to be backed up with rewards, connected to measurable deliverables’ (original director of the LA design and development team, 1996).

Re-education was not the only source of reform. These levels of management were the hardest hit, in the continuing rounds of early retirement and compulsory redundancies. The regional structure was broken up, and re-organised into diffuse geographical groups, which finally broke the traditional, historical definitions forged by the original, small family-run banks. Many of the older managers (50+) were replaced by younger, less experienced staff and this demographic shift did much to influence the attitude towards Lending Advisor.

5.6.4 The 'expensive beasts' do their own typing?
The final emergent issue to be discussed is also the one that probably caught the Lending Advisor team most by surprise. As mentioned above, it was anticipated that a cultural shift of this magnitude would cause points of friction, the details of which
might be hard to predict. On the afternoon that the project director was interviewed, in 1995, he was asked to return to his former region to talk to managers who were refusing to use Lending Advisor if they had to do their own typing. As far as these managers were concerned, it was this issue that threatened their acceptance of the whole system. Typing was an interesting issue, because it was partly created by the shift in individual skill sets imposed by the Lending Advisor project, and partly by the managers themselves, as they attempted to live out the professional illusion generated by both the bank's traditions and their own egos.

There was a great deal of pride, and ego, challenged by implementation of the Lending Advisor decision support system. Managers didn't want to admit that they didn't know how to do their job. Typing created an additional obstacle between themselves, and their newly defined work practices. Their sense of frustration tended to be particularly acute, in that critical period of transition, when they typically did not yet feel competent with the system. In order to learn the system, they frequently had to ask for help. It was not in the nature of managers to work together and many felt inhibited; they didn't want to ask for help from a peer, much less a junior. Many managers felt that what was being asked of them was far in excess of their formal training.

The managers lacked some of the most basic IT and keyboard skills necessary in order to do the job that was now being asked of them. As was acknowledged in the shift to modular training, it was too much for most of the managers to assimilate on a one week course. Although this issue shifted over time, originally Lending Advisor input was considered to be non-delegatable; typing was part of the manager's new work practices and he/she should be thinking through the case as it was loaded.

A secretary was regarded by many of the users/managers as an essential part of a professional person's front stage apparatus, and seemed to represent a status symbol to many of the managers (Goffman 1956). Comments of women's 'nimbler' fingers, and aptitude for 'fiddly' tasks abounded. Evidently, they were also assumed to have an intrinsic gift for showing customers to the manager's office, making coffee, tea and essential small shopping errands. Managers who reacted in this way seemed to need a
critical distance between themselves, and the feminine domain of keyboards and typing. Other managers pointed to long years of polishing their ability to write prose on loan applications. The value placed on this ability was reinforced in some regions by grading the loan applications, in terms of written style, as part of the assessment process. It was understandably difficult to break work habits which for some of them had spanned nearly forty years.

The issue of un-realised time-savings convinced the Lending Advisor team that some degree of administrative support might be necessary. However, the implementation of Lending Advisor coincided with a program of re-organization, which radically reduced the number of secretaries in the branch network. Until a new breed of clerical support could be nurtured, there was a gap in the skill set needed within the branches/business centres.
Chapter Six

Strategic management of decision support systems

6.1 Introduction

This is the second, and longest, analysis chapter in Part Three of the dissertation. The chapter is divided into five sections. The first section introduces the chapter and presents an overview of its content. It then continues with a detailed outline of the chapter’s structure.

6.1.1 Overview

Chapter Six engages with, and develops, a number of issues in the information systems literature, summarised in table 6.1. These are mostly concerned with the implementation and realisation of organizational strategy and further develop issues that emerged in the previous chapter. In this way, the thesis contributes to our understanding of the strategic information systems project process within organizations and informs research and practice on other similar projects.

- The role of IS strategists (Zuboff 1988; Walsham 1993)
- The role of leadership in IS projects (Walsham 1993)
- The balance between autonomy and control in IS strategy (Walsham 1993)
- Decision support systems restrictiveness (Silver 1990)

Table 6.1 Issues in the IS literature developed in this chapter
Further, this chapter considers how to maximise the potential benefits of introducing DSS technology with particular emphasis on intended and realised strategy. As summarised in table 6.2, it accomplishes this by presenting a novel re-conceptualisation of DSS and the decision-making that it affects. This goes beyond the narrow, rational role traditionally assigned to it in the literature, adopting instead a situated, hermeneutic approach. Having embraced this ‘other’ concept of DSS and situated decision-making, we discuss the notion of a *critical positioning* of DSS in the corporate skill set.

A hermeneutic analysis of the Lending Advisor case study is proposed in which multiple interpretations of the future exist simultaneously within an organization, and are expressed via networks of power interests that form continually shifting alliances. This provides insights into the outcome of strategic IS project processes within organizations. It also enables an analysis of the strategic market position of UK Bank in which the capacity of computer-based information systems to disembed data from time and space, is critically examined in relation to specialised, local lay knowledge.

- A re-conceptualisation of DSSs as prosthetic eye
- The critical positioning of DSSs in the corporate skill set: enabling ‘smart improvisation’
- The notion of multiple futures existing simultaneously within an organization
- Global transparency vs. local knowledge

**Table 6.2 Conceptual and thematic development in Chapter Six**

Since this thesis represents a further and different logical engagement with the field data, it might be helpful to provide an insight into how this novel interpretation was formed. Following Gadamer’s (1975) philosophical hermeneutic approach, which suggests that we shape reality through our everyday use of and interpretation of language, the researcher developed a growing sensitivity to the language used by those interviewed at different levels within the organization. However, it did not prove as simple as collecting diverse expressions of intent.
Firstly, it became apparent that there were often contradictions within a single interview and/or between language and action. This led to a sensitivity for the emerging ethical consequences of the shifting labour relations and, in particular the issues of agency and dependency. This is explored through Walsham’s (1993) work on the strategic balance between autonomy and control and Zuboff’s (1988) notion of ‘ritual utterances’ which helped understand the narratives of actors at varying distances from the ethical issues generated by the introduction of Lending Advisor.

Secondly, the longitudinal case study method drew the researcher’s attention to a time lag between the LA team’s vision and the corporate strategy that eventually emerged during which it became apparent that LA was being translated by power interests within UK Bank. Behind the competing definitions of the LA project were different groups of actors with their own priorities. The impact of introducing Lending Advisor seemed caught up in this web of power interests at different levels within the organization. Drawing upon the work of Ciborra (1996), Collins (1990), and Harraway (1991), an alternative conceptual understanding of DSS is developed which could support an analysis of the impact of Lending Advisor in this context.

6.1.2 Outline of the chapter’s structure

The perceived time lag between the Lending Advisor ‘vision’, and the emergence of a deliberate UK Bank corporate strategy is pursued in the second section of this chapter. The section begins by acknowledging the potential opportunities presented by DSSs like Lending Advisor. It considers the way in which Lending Advisor supports expertise by, for example, providing organizational memory and enabling access to data. It is suggested that UK Bank may not maximise this potential because, whilst certain structural and processual changes were made within the organization, a management vacuum meant that critical issues relating to the nature of Lending Advisor technology were not being managed, in particular the position of Lending Advisor relative to human expertise.

By way of a contribution to our understanding of the management and use of Lending Advisor, and projects like it, the issues of technologically sensitive leadership and quality training programmes are raised. The next three sub-sections explore aspects of
computer-based decision support systems that need management consideration and the role of training in embedding organizational strategy.

One of the original propositions in the thesis was that computer-based information systems have a unique, and often contradictory, informating capacity. This is explored in the third section which considers the balance between control and autonomy in the formulation of computer-based information systems strategy (Walsham 1993). It is divided into four substantial sub-sections. The first sub-section focuses on Silver's (1990) notion of systems restrictiveness in DSSs and the way in which computer-based decision support both enable and constrain human decision-making. The second sub-section considers the tendency of human agents to project human qualities onto computers and assume that they can relate data to local context. The third sub-section explores the capacity of computer-based decision support systems, like Lending Advisor, to de-skill. It discusses three main concerns: the loss of expertise in UK Bank through early retirements and redundancies; the process of de-skilling a work process in an open-ended domain that must precede its mechanisation; and the reluctance of UK Bank staff to acknowledge the de-skilling potential of Lending Advisor. The fourth sub-section examines why de-skilling the loans process may be risky in view of the essential creativity required to operate in a competitive marketplace.

As a contribution to our understanding of the effects and potential that can be generated by introducing DSSs, the concept of 'smart improvisation' is introduced. Returning again to issues in the IS literature, it is suggested that UK Bank needs to nurture a learning culture, and establish quality training programmes, in order to embed the strategic position of Lending Advisor relative to human expertise.

The fourth section focuses on the relationship between training, organizational strategy and change. It is divided into four sub-sections. The first sub-section considers training as an important vehicle for embedding corporate strategy. The second sub-section explores the considerable shift in culture and skills demanded by the introduction of Lending Advisor. It is suggested that, whilst the Lending Advisor team developed an effective delivery mechanism for the training, this kind of
technology requires a further development in content and approach to training. It discusses recent research (Orlikowski 1996; Orlikowski, Walsham et al. 1996), which suggests that situated, organic learning may provide a more effective way of embedding and managing strategic change than traditional training methods. The third sub-section considers the importance of communicating the new corporate skill set and ensuring that managers understand the position of human expertise relative to the Lending Advisor DSS.

A shift in understanding is suggested, from viewing the DSS as a tool in a tool box, to seeing it in a situated and dynamic relationship with the individual and their social, political and economic context. This brings us to a further contribution made by this chapter, a proposed re-conceptualisation of DSSs. The notion of DSSs as prosthetic eye, or artificial sensory device that supports the human agents' deficiencies by providing large scale statistical analysis, is proposed. It is suggested that this way of conceptualising DSSs is particularly important because of the situated nature of risk assessment.

The final section considers the potential role of Lending Advisor in view of current market conditions and draws upon both the themes developed earlier in the chapter and the unique contribution made by a hermeneutically informed re-conceptualisation of both DSSs and the strategic information systems project. It is suggested that, as the first and largest user of this kind of technology, UK Bank is in the process of assessing how it affects their market position and the opportunities that it presents in terms of cost containment and diversification of their product range. Throughout the Lending Advisor study management insisted that, despite the demise of the local bank manager and regional branch network, they remained committed to local relationship banking. The section concludes with an analysis of the challenges and contradictions for managing local relationship banking from a hermeneutic perspective.

### 6.2 The Lending Advisor 'vision' and UK Bank corporate strategy

Lending Advisor was transformed from a leading edge functional initiative within UK Bank risk management to a ‘mission critical’ project within six months of its pilot.
However, although Lending Advisor gained significant momentum within the programme of organizational change, it is suggested that it may not achieve its full potential within UK Bank.

One should, perhaps, begin by outlining some of the opportunities that the Lending Advisor technology offers UK Bank. It serves as an organizational memory (Stein and Zwass 1995) and provides unprecedented opportunities for portfolio management. The major strength of Lending Advisor is that before, managers had nothing to support their decision making, now they have access to a source of centralised organizational information. All the managers interviewed considered the electronic transmission of data a great improvement. It has resulted in a very constructive process of ‘brainstorming’ emerging between managers. Although they were not so appreciative of the projections function on Lending Advisor at the time of interview, they may find that with extra training and practice, it does add to their analytical tool box. For example, conducting ‘what if’ analysis for customers as evidence for discourse.

However, we will examine implications of a perceived time lag between the Lending Advisor ‘vision’, and the emergence of a deliberate UK Bank corporate strategy that incorporated the evolving role of Lending Advisor. As detailed in the previous chapter, interviews with project team members suggested that, whilst they recognised the potential opportunities for a ‘revolution’ within UK Bank, offered by Lending Advisor, they did not imagine that this would ever come into being; and to expedite the executive business case, did not present it as such to top management. However, other functional lines began to see the potential for change that Lending Advisor provided, and started to harness it to achieve their own latent interests. Indeed, one year into the project, the Lending Advisor team had to sit down and set boundaries for the project scope, as they found themselves being drawn into so many other initiatives.

These emergent process innovations had not been presented to executive management as part of the original Lending Advisor project nor, once this ‘tinkering’ began, was it necessarily shepherded towards a realisation of a corporate ‘over-strategy’ formulated
by executive management. The innovations were developed from ideas that had been discussed at individual, and group level, by managers within UK Bank for some time; they were, in effect, changes waiting to happen. Lending Advisor just happened to provide a vehicle and opportunity for co-ordination of these tactical objectives.

The Lending Advisor team director recalled this period of synergy on the project with what appeared to be equal amounts of enthusiasm, anxiety and frustration: 'It took a year to establish what the appropriate scope of the LA project should be. There were points at which the scope was running away from us, especially once the other functional and corporate areas of the bank began to sense the opportunity before them. It was beyond the scope of the LA project team to decide what the bank would look like after all these changes had been implemented' (director of the LA design and development team, 1996).

Lending Advisor certainly had direct implications for corporate strategy, but this was beyond the project team's responsibility. They found themselves in a position common to many other IS strategists: the technology that they were developing could enable a transformation within the organization, but this level of strategic planning did not fall to them. Instead, the Lending Advisor team focused on re-designing work processes at an individual and sub-unit level. To have planned the Lending Advisor project further would have meant entering the domain of corporate strategy.

The field data indicates that senior executive management had little or no awareness of the concepts underlying Lending Advisor; indeed, the assistant project director recalled having to 'programme' them to say the appropriate rhetoric, at the appropriate time, during the early stages of the project. Earl (1988) and Galliers (1991) suggest that this is one of the major difficulties that IS strategists face: 'a continuing lack of understanding and appreciation of the importance of IT at higher levels of management, and the nature of corporate objectives and the strategic planning process' (Knights, Noble et al. 1997).

Executives often exhume the flaccid rhetoric of a culture gap between their IT department and the business, to explain this void in their strategic repertoire. In the
days of centralised computing, with its primary focus on mainframe transaction processing, this may have been easier to accept. However, if one takes Zuboff (1988) and Walsham's (1993) notion of an 'enlarged constituency' of IS strategists seriously, and considers the case of the Lending Advisor team, this is no longer sustainable. Rather, it levels the terrain, allowing us to see executive management wrestle with many of the same issues that the users/managers in the study fought with in order to be able to do their job in a computer-mediated corporate environment: basic IT skills and education; technophobia; and illusions of expertise, rooted in tradition, which have allowed them to circumvent hands-on use of computer-based information systems by delegating their interests to juniors in the hierarchy.

Indeed, this brings us back to Walsham's (1993) comment that the "enlargement of the constituency" of IS strategists does not suggest a 'diminished importance for leadership'. Who had responsibility to co-ordinate, or formulate, the expanded Lending Advisor project with corporate strategy? Where was the executive leadership? Executive management drew upon their business knowledge to encourage development of the corporate market programme, which swept through profound rationalisation and cost-containment in the organizational structure and sometimes seemed to be 'tail-gating' the Lending Advisor project. However, the concerns of this thesis are the consequences that arise from the introduction of computer-mediated interpretation of risk. Critical questions asked by this research are, therefore: who appreciated the unique nature of the Lending Advisor technology? Who continued to manage the emergent issues and implications of this technology for the UK Bank?

The senior members of the original Lending Advisor team were promoted out of the project before the system was implemented. The director of the design and development team (1996) commented: 'I was always concerned with how well I could do the project, not whether I could do the project. I always felt that I needed more time to embed that project. Perhaps another years work was needed to achieve all that I wanted'. Indeed, he felt so strongly about this that, on his insistence, part of the terms of his next appointment were that he remained in the post long enough to 'see the project through'. The definition of this last statement subsequently came into contention when executive management attempted to move this senior manager once
again, during what he felt was a critical stage of this next project. As a result, the senior manager decided to leave UK Bank to establish a change management consultancy business of his own.

For an extended period during implementation, therefore, the Lending Advisor team did not have a director or senior project manager, and struggled to keep up both momentum and continuity of management. During an interview, with the former assistant director in this period, he commented on the problems arising from a management 'vacuum'. The team was then hit by tragedy, when the senior manager subsequently appointed from among the original team was killed in an accident.

The users/managers in the study commented on the lack of continuity in the project focus/feedback groups that they worked on. Many of them felt that the standard method of 'culling' membership, rather than rotating it, meant that a valuable cumulative learning process was being lost: 'There was a sense that the next group began by re-inventing the wheel, which was frustrating' (user/manager, 1995).

The premature departure of the original project group meant that their interpretation of the strategic concepts underlying Lending Advisor were never embedded in the way that they intended. Their inevitable concentration on transforming the loans process task, at individual and sub-unit level, meant that the corporate role of Lending Advisor was not deliberately formulated. More specifically, the 'corporate skill set' was not assessed and communicated, which led to a good deal of confusion and insecurity among users.

The traditional career path within UK risk management had been wiped away; management grades had been conflated from eight to three; their secretaries had been taken away; and the once unimaginable compulsory redundancies were now a part of everyday life. The LAMs may have been assuring users/managers that Lending Advisor was there to support their expert decisions, but their efforts reverberated with a dissonant clash against the new generation of managers, for whom Lending Advisor was a 'welcome way to bypass the individual manager's prejudice' (risk analyst
Cambridge regional office, 1996), and the proclamations of the UK Bank CEO: 'traditional bank managers - who needs them?' (June, 1994).

The potential legacy of executive 'numbness' to the Lending Advisor technology could be far reaching, considering the key processes that it was now mediating. It is important for UK Bank to reach some kind of assessment of their current corporate needs, in terms of skill sets. The ambiguity that remains, concerning the relative position of human expertise to that of computer-based decision support systems, is potentially corrosive to the long term future of UK Bank and companies like it.

The notion of practical consciousness and routinisation is of particular significance with computer-based decision support systems. As noted earlier, Giddens (1984, 1991) maintains that human agents do not break off from their context as they go about their work processes; they are involved in it and it has an influence on them. These managers are not just calculating 'rules', they are making a situated interpretation of risk. There is a reflexive relationship with context, or double hermeneutic, at work with Lending Advisor; the manager is interpreting Lending Advisor's interpretation of the risk involved in a loan, and will be influenced by how his/her interpretation of this will be interpreted in the current organizational context. The reality that IS strategists shape through their actions, language and symbols interaction are of crucial importance here.

This reflexive dynamic with context has to be managed and, at the close of this research study, it was not apparent that UK Bank knew quite what relationship the computer-based decision support system was to the user/manager. What is certain, however, is that UK Bank cannot afford to have a generation of managers who use this technology ineffectively, or whose decisions are distorted through this reflexive process with their environment. Systems like Lending Advisor, and the managers that use them, need both technologically sensitive corporate management, who understand the nature of technology in use, and innovative training programmes to embed a critical relationship. The next section will consider in detail the aspects of Lending Advisor technology that executive management need to be sensitive to when strategically positioning it with human expertise.
6.3 Managing the balance between control and autonomy

The balance between control and autonomy is of central concern in the formulation of computer-based information system strategy (Walsham 1993). As noted by Zuboff (1988), the unique nature of computer-based information technology is to simultaneously enable greater central control, and increased local flexibility over work processes. Whether or not this flexibility translates into autonomy is questionable, and depends upon the way in which the information system is managed. For example, it was the intention of the Lending Advisor team to give users/managers higher personal discretionary limits on loans mediated by the system. This would give the user/manager greater personal flexibility to sanction loans, within a spectrum of parameters specified by Lending Advisor. If the manager overrides the Lending Advisor parameters, he/she is forced to assume more of the entrepreneurial risk involved in the loan; in other words, their autonomy comes at a greater personal price.

Lending Advisor was intended to 'replace the culture of formality within UK Bank with one of discipline with regard to lending processes' (assistant project director, 1995). However, this kind of discipline can be taken too far. Managers need to be able to improvise, in order to operate in the market and act when they see an opportunity, or a 'good risk' (Ciborra 1996). The control and central planning represented by Lending Advisor is particularly challenging in this respect. If it is not managed carefully, it could generate a form of Irving Janis' (1982) 'Groupthink' which could have a profound and negative impact.

Managers may prove fearful of exercising the option for displaying entrepreneurial artistry. Lending Advisor may encourage them to conform, and managers may end up being self-disciplining, in line with the limitations imposed on them. As the original director of the project was well aware, supervision and day-to-day management are particularly important in this respect: 'People respond in the way in which an organization trains them to respond....One of the most important aspects of this process, is the way in which the use of those tools and devices are rewarded or punished. An organization can announce a strategy, but it is how the supervisors implement it lower down the organization that will decide whether the ethos will be one of creativity or control. It is this that either stunts, or encourages, creative
behaviour. This has to be backed up with rewards connected to measurable deliverables' (director of the LA design and development team, 1996).

However, the disciplining and controlling tendencies of this kind of technology are exacerbated and shaped by two further influences. Lending Advisor is a highly rational tool, based on an idealised model of risk and risk assessment. There is a tendency to ‘black box’ these kinds of quantitative models, in a way that puts them beyond critical questioning. Secondly, it is easy to be seduced by the modern, scientific image of the ‘computer’ and its promise of objectivity. Managers often find the opportunity to increase their control of the risk in their environment very alluring.

Lending Advisor provides an organizational memory (Stein and Zwass 1995) for the first time, and access to data that had previously been distributed through the local branch network. However, just because a decision is based on more data than before, does not necessarily mean that it will be the ‘right’ decision. Spender challenges a further myth, that since organizations have information adequate to the decisions that must be taken, managers can be coolly objective (Spender 1989); and the related myth that since managers know everything relevant about the organization they can control it completely which, he maintains, generates excessive expectations of corporate planning.

The individual making the decision is still part of their broader social and political context, which influences how that data is interpreted. This brings us back to Boland’s (1987) five fantasies of information. These explore the misconceptions that information is structured data; that an organization is information; that information is power; that information is intelligence; and that information is perfectable. He maintains that it is the human being that gives data meaning, through a process of appropriation in which their interpretation of the data is crucial, and profoundly situated: ‘In the social world, problems do not exist as objects, decisions do not exist as objects...and intelligence does not exist as an object, except as it is embodied in a human being. Information is not a resource to be stockpiled as one more factor of production. It is meaning, and can only be achieved through dialogue in a human community’ (Boland 1987).
Unlike human agents, a Lending Advisor assessment is trapped in time, able to only offer one interpretation of current events, based on past data. In this respect it represents ‘frozen organizational discourse’ (Bowker and Star 1994). The Lending Advisor technology was intended to be an evolving system, responsive to the market place but, as has been discussed in earlier chapters, the speed at which these parameters of the system can be adjusted has proved much slower than anticipated.

Despite these limitations, technologies like Lending Advisor can be useful, but it is important that the underlying concepts behind them are understood. As Bernstein (1996) warns us: ‘Nothing is more soothing or more persuasive than the computer screen, with its imposing arrays of numbers, glowing colors, and elegantly structured graphs. As we stare at the passing show, we become so absorbed that we tend to forget that the computer only answers questions; it does not ask them. Whenever we ignore that truth, the computer supports our conceptual errors. Those who live only by the numbers may find that the computer has simply replaced the oracles to whom people resorted in ancient times for guidance in risk management and decision-making’.

The models embedded in the Lending Advisor system are better understood as a tools for learning (Lane 1992). By 1996, a new management team was in place on the Lending Advisor project, which had now achieved 'business as usual' status. One of the major challenges facing this team, and the Lending Advisor II team, was communicating the evolutionary nature of this kind of technology. It had previously not been adequately communicated on the project and they were concerned that when introduced at this late stage, it may be difficult for management at all levels within UK Bank to accept. Their concerns were confirmed by the field research data which indicated that most of the users/managers assumed that this system would remain static, as had the more familiar 'backroom' mainframe transaction processing systems. The assumption was that a system would only be replaced if it was outdated, or had been found to be 'wrong'.

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6.3.1 The restrictiveness of DSS like Lending Advisor

One of the aspects of managing computer-based decision support systems, like Lending Advisor, is to develop an awareness of the way in which they alter the dynamic relationship of autonomy and control between the organization and the individual user. If the DSS is intended to mediate key business processes, it is crucial to appreciate how they intervene in the decision-making process. It has direct implications for the way in which the computer-based decision support technology is positioned within the organizational strategy, which should make it of particular interest to executive management.

Silver maintains that DSS are 'at once expansive and restrictive' (Silver 1990). To use the verb 'restrict' to describe a DSS may seem counter-intuitive; after all, when a manager receives a DSS, his or her information-processing capabilities are augmented, not reduced (Silver 1990). However, any computer-based decision support system has a finite set of functional capabilities, which will necessarily constrain the decision-making of the human agent who is dependent upon it.

Silver's defines systems restrictiveness as 'the degree to which, and the manner in which, a Decision Support System limits its users' decision-making processes to a subset of all possible processes' (Silver 1990).

![Figure 6.1 System restrictiveness (Silver 1990)](image)

The outer ellipse corresponds to the universe of decision-making processes for solving a given problem, while the inner ellipse represents those processes supported by a
given DSS (Silver 1990). The diagram is mis-leading in as much as it gives the impression that one can bound the universe of possible processes or of system restrictiveness. The relative size and position of the supported processes to its universe is, of course, highly variable depending on the system under study.

The sources of system restrictiveness are, to use Silver's terms, both 'objective' and 'subjective' (Silver 1990). These are problematic terms in the social sciences, but serve to guide this brief discussion, and to point towards aspects of both technology and human agency that shape the local possibilities of decision-making. Embedded in DSS technologies, like Lending Advisor, are four principal system components: operators; sequencing rules; adaptors; and navigational aids. The range of information-processing activities offered by the system, through these components, will restrict the users' choice of decision-making processes within a defined range. For example, users of the Lending Advisor system had no control over the parameters set on the system, or its visual representations. They remained unaware of the values assigned to their subjective input and how sequencing rules determined if and how data are combined.

Indeed, the restrictions of Lending Advisor were rapidly discovered by managers. They spent long hours trying to make individual loan applications 'fit' the system's requirements. In particular, peer group data was one of the major concerns voiced by managers in this respect. They were confined to presenting their individual cases by industry codes. Any classification is necessarily arbitrary, and there will always be exceptions; users/managers were concerned that customers could potentially gain or lose by being assessed in the wrong categories. Knowing that other managers faced the same dilemma, they were correspondingly sceptical about the quality of data on the Lending Advisor database.

On the training courses managers were told that, in the future, they would present the Lending Advisor assessment to customers and work through it with them. Managers frequently cited their lack on confidence in the peer group data as the reason why they did not show customers their Lending Advisor assessment. They felt that they could not justify to them why a customer had been put in an industry code, or who they were
being compared to and why. The Cambridge region LAM (1994) said that he regarded 'peer group data as the potential 'big black hole' of the Lending Advisor system'.

Silver maintains that some aspects of restrictiveness are 'in the eye of the beholder', and further that the users' subjective assessment of systems restrictiveness often differ from 'objective' restrictiveness (Silver 1990). The notion of assessing systems restrictiveness is problematic for several reasons; firstly, we don't really understand much about human decision-making processes or how computer-based decision support systems affect them; and secondly, the user's assessment of the system's restrictiveness is highly contingent. Users will not be interested in the full set of possibilities offered to them by the DSS; they will look for the decision-making processes perceived to be appropriate to the problem in hand, and relate those to the processes that they can execute on the DSS.

Silver's (1990) treatment of the issue of human agency focuses on an important, but narrow and detached, range of considerations. He suggests that awareness of system capabilities will be influenced by: poor design; unclear documentation; and inadequate training. Whilst management need to acknowledge the existence of system restrictiveness, and understand the impact of both objective and subjective restrictiveness on DSS use, they also need to consider decision-making processes as a situated activity; a dimension not embraced by Silver. Management must be sensitive to the consequences of both of Silver's forms of restrictiveness, but further consider them in the social, political and economic context of the organization.

6.3.2 Humanising the computer

A subtly different problem to the above, but also problematic, is what humans may do to DSS processes and output. Firstly, the tendency to 'humanise' the computer-based information system, and secondly, belief in their infallible, scientific nature. Sherry Turkle (1984) has suggested that the computer is an evocative object that lies between the living and the dead. As such it draws on a long tradition of phenomenon that has inspired the human fascination including Frankenstein, cyborgs, vampires, and primatology (Harraway 1991). Her study of various computer users (within
organizations, but also hackers, and gamesters) suggested that they tend to project human qualities onto the computer.

It was apparent from the language that some of the users/managers used to describe how they related to Lending Advisor, and how it contributed to their everyday work practices, that in some ways they attributed it with human characteristics. As Harry Collins has noted, this is potentially problematic because machines do not respond to contingencies in the same way that humans do; they do not ‘repair’ responses in the same way that humans do (Collins 1985). Human beings are particularly adept at filling in gaps in information that is given to them, and can make logical deductions based on partial data.

Computer-based information systems do not have this capacity. For example, if a person says that their dining room table is 2 metres long, their guests would not be surprised if it were a little more or less than 2 metres. If you asked one of the people sitting around that table how tall they were in feet and inches, and then asked them to convert that to metres for you, even though the conversion is one inch to 25.4 mms, they will tell it to within two decimal points, not four or five. This is because the convention within human society is to give height to within two decimal points. The knowledge that a computer lacks is 'inside' knowledge of the conventions in different human communities. That is why, for example, Lending Advisor could not cope with Fenland agriculture which produces crops on a seasonal basis or media companies who form to produce one film. They were commercial communities beyond its inference.

Secondly, there is the problem created when human agents 'buy' into the concept of technology, aptly illustrated by the recent victory of 'Deep Blue' over Kasperov. Kasperov mistakenly believed that the programme's ability to test every scenario was infallible; as a result, he assumed that he had no option but to surrender a key game to Deep Blue. It later emerged that an error in Deep Blue's programming had meant that it had not explored what could have been a winning strategy for Kasperov. When this came to light, he accused the computer of 'cheating'.
In a similar way, UK Bank users/managers may come to 'believe' in Lending Advisor, and might not explore all options thoroughly for themselves. After all, 'progress' and 'science' were key words in the corporate promotion of Lending Advisor when it was launched. Lending Advisor's 'scientific nature' could put it beyond questioning in the minds of the users/managers. Particularly since Lending Advisor is supposed to represent UK Bank's corporate lending policy and expert parameters, users/managers could be lulled into dependence on its interpretation. Users/managers may decide not to communicate personal concerns, since Lending Advisor is 'sanctioned by science' and they are 'just' a lay person (Wynne 1996).

Human agents are very ingenious at repairing and adapting to technologies; however, they have to have specialist, local expertise to do so. Part of the knowledge engineering approach is to regard knowledge as the property of the individual, rather than interaction of the social collectivity (Collins 1990). 'Real expertise is sometimes a matter of seeing a new situation as an old situation, sometimes a matter of responding to new situations in a new way, and sometimes a matter of creating the socially legitimate or effective response...It is in the collectivity that novel responses become legitimate displays of expertise' (Collins 1990). The next sub-section will go on to explore the de-skilling potential of computer-based decision support systems, like Lending Advisor and, in particular, consider the consequences of UK Bank's programme of redundancies and early retirement in middle management.

6.3.3 Risks: how Lending Advisor can de-skill

As Silver (1990) says, 'we build Decision Support Systems to enhance human judgment. But the line between supporting judgment and replacing it is often fine; DSS can deprive users of their judgmental powers as easily as they can enhance them.' As noted above, Silver contends that this 'line' is determined by the degree to which DSS supports and restricts human judgement primarily through its design parameters. The emphasis in this thesis has been that this is also determined by how it is managed and by the quality of the training that the managers receive. There are three main concerns here: the loss of expertise in UK Bank through early retirements and redundancies; the process of de-skilling a work process in an open-ended domain that
must precede its mechanisation; and the reluctance of UK Bank staff to acknowledge the de-skilling potential of Lending Advisor.

In interviews with experienced loans managers, the consensus seemed to be that Lending Advisor was a decision 'confirmer' in most cases. It occasionally highlighted some areas that would prompt the user/manager to ask questions that he/she would not otherwise have done but, apart from this, its assessments rarely surprised them. One Lending Advisor project manager's (1995) summed up the impact of Lending Advisor on users/managers in the following way: in his opinion, managers fell into three 'buckets' of user type. 'There are the good, traditional lenders who view LA as a useful tool, but who invariably tell me that it doesn't tell them anything they didn't already know about their lending. Secondly, there are the not so good lenders, who won't ever crack computers or feel comfortable with the system. Then there are the 'run of the mill' lenders, who buy into the system and 'go for it'. For this group LA focuses them on areas that they didn't look at before; for example, the management structure of a company. LA channels their efforts and highlights their strengths and weaknesses as lenders that they might not have covered before'.

For experienced managers working in UK Bank who could draw on their past experience to 'critique' the Lending Advisor assessments, the system did not seem to be de-skilling. It would have been difficult to take away skills that were already learned; the challenge for these managers was to actively 'interrogate' the system and learn ways of using the software. The concern with Lending Advisor is its capacity to de-skill the future generations of managers particularly since, by the end of the study, all of the managers over 50 years old who had taken part in interviews had been put into early retirement.

Further, it is argued here that UK Bank may use Lending Advisor to de-skill the future of that layer of middle management within UK Bank. While experienced managers remain, they can critique the Lending Advisor assessments, but it seems increasingly apparent that such manager are being made redundant one way or another and that less skilled staff, with less training, and working for less pay, will be sitting before Lending Advisor in the future. The more ominous consequences of implementing...
‘smart machines’, to make a dual use of Zuboff’s term, is that they may seduce
executive management with ‘a dream of perfect control and heal egos wounded by
their need for certainty...but in the shadow of the dream, human beings have lost the
experience of critical judgment that would allow them to no longer simply respond
but to know better than, to question, to say no’ (Zuboff 1988).

Lending Advisor’s assessments are based upon historical data. In order to manage the
risk in the future, Lending Advisor’s models uses data from the past. As Bernstein
(1996) reminds us: ‘therein lies the logician's trap: past data from real life constitute a
sequence of events rather than a set of independent observations, which is what the
laws of probability demand. History provides us with only one sample of the
economy and the capital markets, not with thousands of separate and randomly
distributed numbers. Even though many economic and financial variables fall into
distributions that approximate a bell curve, the picture is never perfect. Once again,
resemblance to the truth is not the same as truth. It is in those outliers and
imperfections that the wildness lurks’.

Is UK Bank losing the human expertise necessary to cope with the day-by-day
emergency management needed in recession, when historical data are no longer
relevant, as they ‘retire’ grey hairs? The former director of the Lending Advisor
design and development team (1996) was concerned about how customers would
respond to the demographic shift within middle management, the visible ‘lack of grey
hairs’. However, he rejected the suggestion that the bank was losing expertise.
‘Those same “grey hairs” had been useless in 1989....I am not saying that collective
corporate wisdom isn’t important, because I believe that it is, and that LA by itself is
not sufficient - but neither were the “grey hairs”’. His attitude towards the older
managers typified the new approach taken by UK Bank. The generous pay and
benefit packages received by mature managers had made them an obvious target of
rationalisation. The demographic shift taking place in middle management is altering
the content and quality of the knowledge community that is now available to interpret
and critique Lending Advisor.
The notion of knowledge communities highlights problems associated with the knowledge engineering process. This is a process by which 'knowledge' is 'gathered' from experts in order to design and develop the DSS. Experts are forced to break down their work processes for mechanisation. There are, according to Dreyfus (1979), certain kinds of bounded knowledge domains which are relatively independent of context and therefore can be computerised; for example, games like tic-tac-toe or chess. However, there are further categories of intelligent activities that are 'dependent on meaning and situation which are not explicit' (Dreyfus 1979; Collins 1990).

An important issue here is the social nature of human agents and their active, reflexive relationship with community. Although experts use certain heuristics and aide memoirs in open-ended domains, they rely upon cumulative, local knowledge acquired through interaction with a community in order to be able to respond to novel situations in a timely way; corporate loan assessment falls into this category. Many of the difficulties experienced by users/managers of Lending Advisor were 'the result of forcing...interactions into the narrow mold provided by a limited formalized domain' (Winograd and Flores 1986).

As Collins (1990) says: 'Those who want to substitute human labour with machines must first arrange the job so that it can be done in a machine-like way; that is where so-called deskillling comes in'. It is not mechanisation that de-skills, it is the process of taking the 'thinking' out of the work process before trying to computerise it that de-skills. This is illustrated quite well in the Lending Advisor case study.

The director of the design and development team described how they went about defining what a 'quality' loan decision consisted of: 'When we began asking people what 'quality' was we very often got the reply that we would never be able to find the rules that defined quality, lending was a 'gut feeling', an art. To which I would reply, "So, you can't define for me what a quality portfolio is?" "Oh, yes!" they would say, "You can..." I would sit them down and say, "Well, how do you define it?" I had to cajole them and over time we broke down the structure of how these managers went about lending' (1996).
The concern here is that work processes are reduced to 'bits' in order to mechanise them, and then this de-contextualised and reduced representation comes to be seen as the 'standard' for the job by which subsequent human efforts are measured. Symbols encoded in computer-based decision support systems do not by themselves preserve and carry meaning, they depend on expert human agents to interpret them. The change in culture within middle management in UK Bank, and the breakdown of the local branch network, will generate a new knowledge community. Their decision to 'retire' so many experienced loans managers intensifies the need for close management of the present system and quality training of present and future loans managers.

Lending Advisor's capacity to de-skill was a highly contentious topic during the research. It was interesting to record the rhetoric from different Lending Advisor project stakeholders. There was a distinct schism between the intent of the inventor of Lending Advisor system and public attitude of the CEO of UK Bank on the one hand, and contrasting assertions from those involved on the project team and implementation on the other. As mentioned in the introduction, Gadamer's (1975) philosophical hermeneutics draws our attention to the ways in which we shape reality is through our everyday use of and interpretation of language. As a result, the researcher developed a growing sensitivity to the language used by those who were mediating power interests at different levels within the organization.

In interviews, the original inventor of the Lending Advisor system was asked what he thought his product was going to be used for. He said it would 'be used to reduce costs, primarily human resource costs, by de-skilling the loans process. I hate to think about it, but I suppose hundreds of people will lose their jobs as a result of the product. But, if they are, it actually means that the system is doing its job, which is good' (inventor of Lending Advisor, August, 1995).

In an academic article written by the inventor and his colleagues, one of their stated objectives was to enable skilled work process to be undertaken by less experienced users: 'Over time, these professionals develop extensive expertise meriting greater decision-making authority and responsibility than can be given to more junior people.
We developed Syntel [the computer language underlying Lending Advisor technology] to capture such expert knowledge naturally, and to disseminate it effectively among less experienced but still professional users’ (Duda, Hart et al. 1987).

The cost of human resources relative to the return from computer-based loans assessment was the focus of the UK Bank CEO's comments: 'Automated credit rating is more effective than the judgement of Bank staff - and certainly cheaper' (4th June, 1995). Yet, if Lending Advisor team members or LAMs were asked in interviews if Lending Advisor was a sophisticated credit scoring system, the researcher received hot replies and its association with this deskilling phenomenon denied. For example, the project director replied: 'LA pools best practices. LA is nothing to do with credit scoring. The LA system was never positioned to make lending decisions. It observes decision making and acts as the organization’s memory. LA doesn’t make the decision for the manager' (director of the LA design and development team, 1996). This was clearly a line that could not be crossed and language that could not be allowed with regard to Lending Advisor.

Managers were left to make interpretations of their own. One user/manager outlined the official goals of the Lending Advisor project as articulated by the team and then added: ‘These are the official goals; however, I feel that there is another agenda. Personally, I think that Lending Advisor was designed to de-skill the job, which they would probably call ‘speeding up the analysis’. In my opinion, managers are losing the flexibility and control that they used to have. The guidelines for lending in some areas are so particular that it is difficult to justify spending time on an account if it doesn’t ‘fit’ formula lending. The only defence for the line of action that they are taking is that the Bank’s record on lending is appalling. Top management have decided that people are the problem and are trying to eliminate the human factor from the process’ (user/manager OL, 1995).

Zuboff (1988) offers us some insight into why the LA team insisted on the primacy of the human being even in the face of the rhetoric of their own CEO and the company that they bought the software package from. The statements that the team made about
de-skilling had a decidedly ritualistic quality to them, which Zuboff suggests is ‘like a tail dutifully pinned to a long body of discourse that focuses exclusively on the technology’ (Zuboff 1988). The resistance to the notion of de-skilling could have been conditioned by the knowledge that this research project would include a period of time spent with users/managers, or be fed back to the sector, and in both cases they were anxious to sustain an image of expertise. Zuboff cites the work of the historian of religion, Jonathan Z. Smith, who studied the ritual practices associated with hunting practices all over the world:

‘These practices displayed an elaborate etiquette that must be followed if the animal is to be sanctified for consumption. In some groups, the animal may be killed only when facing or running towards the hunter. Some require the animal’s wounds to be bloodless or prohibit wounding the animal in other than the specifically designated parts of its body. ... Smith points out that, in actuality, a hunting people that depends upon fresh game for its survival could hardly afford to leave behind a corpse because it was killed “impolitely” or to pause before the kill in order to recite a love song to the onrushing beast. Such accounts are not plausible, but their regularity suggests a deeper significance. The existence of such rituals indicate the groups’ awareness of the “way things ought to be” in a perfect, well-ordered world. The demands of everyday action rarely permit us to act in accordance with what we know is best, but the presence of ritual is a way of overcoming this discrepancy between values and actions’. (Zuboff 1988)

The members of the Lending Advisor team were locked into the logic of implementing Lending Advisor. Yet, they anticipated suspicions about de-skilling and tried to ward them off. ‘It is as though they believe that in the best of all worlds, machines would serve people, but in the real world, it cannot always be so...Their statements betray both what they believe ought to be, according to some larger human etiquette or sense of responsibility, and what they know is the case....If Smith’s hunting peoples can teach us something, it is that the need for such ritualistic statements will grow in proportion to the remoteness of values from actual practice’ (Zuboff 1988).
Members of the Lending Advisor team did not seem able to face up to the implications of the process in which they were involved. Indeed, there were many issues that tended to be sanitised by these highly rational technological and organizational rhetoric. It is suggested that this highlights a process by which individuals protected their self-identity and avoided ethical entanglement by allowing a high degree of 'slippage' between their everyday language and that of a sanitised, legitimating rational, scientific discourse. The question that presents itself is, how far and how long can organizations afford to be blind to the ethical and political consequences of such actions? And with regard to this thesis, how does the current ethical numbness of the life conditions encountered in the workplace with its complex, conflicting messages affect the individuals users and their perception of their situation?

These are important questions which relate to the notion of situated risk assessment discussed in the next chapter. Based on discussions thus far, it seems that the extent to which Lending Advisor de-skills is largely a question of how it is positioned relative to the expertise of human agents in the corporate skill set and managed on a day-to-day basis. Having acknowledged the restrictive capacity of computer-based technologies like Lending Advisor the next section will consider the issue of autonomy and entrepreneurial creativity.

### 6.3.4 Essential creativity in the marketplace

Information systems such as Lending Advisor are based upon notions of planned decision making designed as rational models. They do not embrace the role of entrepreneurial creativity in market transactions. And yet, as Ciborra reminds us: 'improvisation is a much more grounded individual and organizational process than planned decision making. As a consequence, if information technology is used to automate structured, planned decisions, the risk is to automate ungrounded organizational processes. This many be an explanation of why many automated routines make little sense, or at best embed the knowledge of a novice, and subsequently have to be continually “worked at” by members in order to keep them viable' (Ciborra 1996). This may elucidate the frustration voiced by users/managers
regarding the long hours spent making cases 'fit' on Lending Advisor and the lack of return for this effort.

It is the contention of this thesis that 'improvisation is not just a response by human agents to situations of emergency, it plays an important role in the everyday life of economic institutions' (Ciborra 1996). The rational model of a manager who executes planned action based on timely data, negates the way in which human agents continually learn and improvise while working (Brown and Duguid 1991). Managers are too often treated as a decision-making ‘black box’ automaton rather than as the lively entrepreneurial creator of the business. ‘The manager is no longer part of the decision; he is simply the theory’s instrument... His only options are to follow the theory’s dictates or to make an error (Spender 1989). Yet managers are knowledge creators as well as knowledge users (Spender 1989).

Ciborra defines improvisation as a 'situated performance where thinking and action seem to occur simultaneously and on the spur of the moment' (Ciborra 1996). It is this emphasis on interpreting a novel situation in a timely way that is problematic for Lending Advisor. Pooling organizational memory (Stein and Zwass 1995), and systematically exploiting opportunities according to the parameters of rational, quantitative models, may be efficient. However, these forms of ‘industrial harvest’ aside, certain kinds of vital growth depend on creativity and breaking rules; on improvising. Not as the norm perhaps, as this may prove too risky, but there should be scope, recognition and reward associated with the ‘acceptable exception’.

Financial services are likely to be wary of this in light of the huge losses recently encountered by rogue traders in the markets. Their own recent losses may mean that they are lurching towards risk aversity as the result of recent losses of the 1990’s. Both the Bank of England and corporate shareholders responded to those losses with calls to contain risk and risk takers. UK Bank shareholders clamoured for the bank’s portfolio to be skewed towards the safer end of the risk spectrum in order to avoid being exposed to volatile market pressures (Lending Advisor project director, 1995). Whilst this is understandable, it may be shortsighted, assuming risk is a healthy and essential part of being in a competitive marketplace.
In his paper on improvisation, Ciborra (1996) quotes Hayek (1945): ‘For the Austrian economist, the market is essentially a discovery process, where new opportunities and innovations are relentlessly found out... Relevant knowledge is ultimately in the hands of those actors “who are familiar with such circumstances, who know directly of the relevant changes and the resources immediately available to them”’ (Ciborra 1996). If improvisation is sometimes essential to operate successfully in any financial market, then it is further argued that it is a situated performance and therefore local knowledge is crucial. The emphasis is on timeliness, being able to recognise an opportunity and respond to it before your competitors.

As Ciborra says (1996) ‘In a market, one finds the key components of improvisation seen as a way of quickly adapting to change: immediacy; situatedness; idiosyncrasy; local knowledge; access to and deployment of resources at hand’. Both the loan managers and UK Bank need to be able to make those essential shifts in navigation towards their objective made by the Micronesian seafarers described by Lucy Suchman (1987) in her book Plans and Situated Actions. She contends that ‘the nature of an activity can be missed unless one views purposeful action as an interaction between a representation and the particular contingent details of the environment’ (Suchman 1987).

Lending Advisor could support what Ciborra refers to as ‘smart improvisation’ (Ciborra 1996), if they sustained a critical level of situated local expertise which could be depended upon to populate the Lending Advisor database with quality input. This input would then have to be manipulated by models that were responsive to the global economic and social environment.

There are currently several obstacles preventing UK Bank from realising this. Firstly, smart improvisation still relies on experienced experts being able to interpret the data presented to them on Lending Advisor. As already mentioned, this may be problematic for UK Bank in light of the loss of manager’s over fifty years old in their organizational rationalisation. Secondly, improvisation is situated, and the decline of
branch network and local bank manager inevitably means that their local presence is of a different nature and increasingly technologically mediated.

The quality of manager's input is not only influenced by changes in the dynamic of their relationship with local business communities. As one manager put it: 'When I and other managers get under pressure, human nature takes over and anything that we can do to skate over and save time on Lending Advisor we will do. This, of course, is very dangerous. Managers are becoming adept at avoiding alerts by shifting judgementals to one side or the other of their original assessment and adept at understanding how Lending Advisor comes to its answers so that they can affect the metre by shifting their input. I am not suggesting that managers are being outright duplicitous or telling untruths, they are just being practical. What concerns me about the quality of input from managers is that Lending Advisor makes the subjective input from managers look objective by presenting it in the form of a metre. A metre looks very scientific, but it still boils down to the manager's input which is subject to so many different pressures these days' (manager OL, 1995).

The managers, it seems, are finding themselves constrained by pressures of time, of job performance, and by the realisation that their interpretation is pitched against the legitimacy of Lending Advisor as representative of policy and ambassador of progress. This not only influences the quality of Lending Advisor input, it also creates a context in which their ability to improvise and willingness to take entrepreneurial risk is stunted. The impact of this might have been lessened if Lending Advisor had turned out to be the responsive technology that it was touted as in the early stages of the project.

The Lending Advisor team defined 'quality' as the rules on which you base your lending. 'These rules had to be 'flexed' in a timely way in anticipation of the economic cycle and be in line with the overall strategy of the bank' (director of Lending Advisor design and development team, 1996). Lending Advisor was intended to be a growing system, but it turned out to be more difficult than anticipated to adjust the weightings on the original software package.
The models that drove the system should have been continually evolving. For example, if managers were consistently seeing negative assessments on Lending Advisor for a certain kind of business case, and yet if taken this case proved profitable, the system should be updated to reflect what those managers have learnt about that kind of lending. As the original inventors of Lending Advisor emphasised, ‘Since corporations may have to change rules quickly, responding to changes in business conditions or corporate policy, they must be able to make and distribute those changes quickly.’ (Duda, Hart et al. 1987). The system proved too rigid in this respect and the systems teams were unable to take account of this kind of feedback. An extreme case of this emerged in 1996, when it was discovered that current organizational policy had been hard coded on the long awaited property module by mistake. In 1997, it emerged that Lending Advisor would not be able to cope with the date change that would occur in the year 2000, compounding its inflexibility.

One of the reasons why Lending Advisor was presenting problems with regard to responsiveness was that it took a long time to make changes to the system. One of the characteristics of a network-based expert system is the complex interconnectivity between the variables. The network has the advantage of being relatively ‘side effect free’ compared to rule-based systems, but the engineers do need to know a lot about the other interconnectivity between the variables in the network. This kind of in-depth detail takes time to build up, if you have a high turnover of engineers it can slow development or enhancements. This means the UK Bank is highly dependent on the specialised expertise of Lending Advisor engineers.

The complex interconnectivity between networks in the LA design, and the amount of statistical knowledge needed to understand how they work together and relate to the distributed probabilities associated with them in order to produce an answer, makes it difficult to have an easy-to-understand help function for users. This contributes to the ‘black box’ quality of the assessment produced by LA which in turn gives users the sense that they are being de-skilled. It is much easier to show a user how a rule-based system arrived at its results.
A further obstacle has emerged in the form of systems integration which has meant that data cannot be shared between different information systems. Lending Advisor was developed using an OS/2 platform which proved difficult to integrate with other existing UK Bank legacy systems. This contradicted the specifications of Lending Advisor’s original inventors who stipulated that: ‘To the greatest extent possible...expert systems must fit into standard work-flow patterns. In addition, software must work within existing data processing environments - particularly within existing mainframe-based transaction and database systems’ (Duda, Hart et al. 1987). The agriculture module that UK Bank designed and developed proved particularly problematic in this respect. After several years of development, it became apparent that it would not integrate with the existing UK Bank Farm computer-based information systems.

It is difficult to assess the degree to which manager’s frustration with the explicit and implicit technical details of Lending Advisor contributed to their stress level or how far this influenced their decision-making. At the very least some of the more ‘unfriendly’ aspects of its design, and the cumbersome nature of its interface, served at times as a distraction; at worst, they could have qualitatively influenced the user/manager’s interpretation of situated risk. However the ‘local conditions of technological possibility’ might influence the everyday activities of managers, it should be emphasised that these influences are ‘multi-layered and complex’ and that the outcome of the project as a whole is ‘constituted through the political process that lies at the heart of organizational life’ (Knights and Murray 1994).

The crucial issue here is the extent to which UK Bank are numb to the need to manage this intimate balance between autonomy and control. Management need to understand the consequences of that balance and the technical issues affecting it outlined above. They have to legitimise and support efforts to address them including a consciousness raising exercise throughout the organization regarding the position of the DSS relative to human agents that acknowledges the manager's need to improvise in order to be effective. A key part of this process is the content and approach that is taken to training present and future generations of users.
6.4 Training, organizational strategy and change

As Silver (1990) notes, training is an issue that has not been given sufficient attention in the decision support system literature, yet the introduction of systems like Lending Advisor necessitate a transformation in the organization’s approach to decision-making. UK Bank went through a steep learning curve with regard to Lending Advisor training at the end of which they received an award for their training programme. However, whilst they developed a fairly effective delivery mechanism for the Lending Advisor programme, it is suggested here that the content and approach to training still needed further attention. This is for two reasons; firstly, they need to better appreciate training as a key event for embedding their corporate strategy. It represents an opportunity to communicate critical strategic concepts and add long term value to the organization. Secondly, quality training is essential when intervening in decision-making at this level within the organization with a computer-based technology like Lending Advisor. Training is an opportunity to position the DSS relative to the expertise of human agents; this process is particularly important because of the situated nature of risk in the current local organizational and broader economic context.

Training emerged as an important consideration during interviews with users/managers in the comparative study. In order to give context to each user's experience of implementation, it was very important to find out: when they had attended their introductory course; when the hardware had been installed into their branch; what modular courses the interviewee had subsequently attended; how much of their portfolio they had loaded onto Lending Advisor; how many applications they had actually then reviewed or submitted using Lending Advisor; and whether they were meeting their targets for use set by their region. Their comments and attitude to Lending Advisor were significantly influenced by their answers to the above and the degree of stress that they were experiencing in relation to them.

The evolution of the training programme, from four day residential to one week residential and then to modular training, had considerable influence on Lending Advisor use. Users on earlier courses tended to be somewhat scarred from their experience, as outlined in the case study, and lacked the confidence found in users
who had attended later courses. Managers within the same branch or office were sent on the training at different times which meant that, at first, there was some isolation for those who had been on early courses. For example, managers frequently returned from the early courses and either didn’t touch Lending Advisor, or didn’t have the option because the hardware had not been installed yet. Long periods of non-use, for whatever reason, proved detrimental to their acceptance of Lending Advisor. Managers on later courses had the advantage of the experience gained from those who had gone before. They also had the opportunity of seeing Lending Advisor operational in advance, enabling them to become familiar with the screens, language and commands.

In the traditional 'job-for-life' environment, the main focus of training in UK Bank for managers was not just an opportunity to affirm skills and products, but to meet peers and interact socially. In interviews, managers recalled that the primary source of learning on residential courses was often comparing 'notes' with colleagues over dinner or drinks in the bar, rather than the formal course content. Risk management was considered a stable career path, where managers learnt their 'trade' by spending time in a progression of roles covering all aspects of the local branch processes, in a form of 'on-the-job' training.

In 1990, in a move that would later seem ominous in light of the skills gaps identified among managers during the implementation of Lending Advisor, UK Bank sold its training centre in the south-east of England as part of a cost containment exercise. This seems representative of the status given to training in many corporations which, for reasons that will be outlined, has often been allowed to slip as a priority.

6.4.1 Training as a vehicle for embedding corporate strategy

There is a general lack of appreciation regarding training as a lever in organizational strategy and change (Gash and Kossek 1990; Nelson, Whitener et al. 1995). The majority of research on training focuses on trainee characteristics, for example computer anxiety, playfulness, self-efficacy, visual abilities and learning styles (Compeau, Olfman et al. 1995). Yet, as Gash says, 'If managers persist in viewing end-user training as an individual-level phenomenon, they are wasting their
Researchers who only focus on individual aspects of training are studying the wrong questions and overlooking critical organizational and strategic issues of training' (Gash and Kossek 1990). There is little research into the social context in which training takes place or is subsequently employed, which has seemed so critical in the course of the Lending Advisor study.

Most information technology courses are very practical and short with little focus on 'soft issues' such as organizational culture, norms and values. On many projects, training suffers because it gets crushed in the scramble for implementation and compromised by funding cuts. Although the ultimate cost of poorly trained users outweighs the effort involved in developing effective training, little effort is directed at evaluating training programs (Nelson, Whitener et al. 1995). There are too many intangible benefits to make standard accounting cost/benefits evaluations meaningful.

Training represents an important opportunity to distribute and embed strategic concepts through a discourse that is mindful of the context in which participants will face when they return to their job. 'Of all organizational resources, the workforce is arguably the most flexible, and that flexibility can be encouraged and exploited through the provision of education and training schemes. Unless the social context of information is fully appreciated, and unless organizations become aware of the true nature of crisis, risk, complexity and uncertainty, the benefits of strategic and tactical applications of IT will remain mere wishful thinking' (Angell and Smithson 1991).

Yet, for the most part training is considered a box that is hastily ticked at the end of a project. Research is needed in learning, rather than training, and in the transfer of that learning to the workplace. Otherwise the corporation is like Pavlov training his dogs: managers will play along with such training and trainers will get a response, but won't ever understand the philosophy behind the actions.

The most relevant aspect of the training literature to this case study focused on a process of needs assessment which is advocated by many researchers and, in principle at least, extensively used in business. The key authors here are McGehee and Thayer's (1961) whose approach identifies three "content" areas: organizational, task
and person. This provides a model to help us understand the relationship between training and strategic skill sets. Nelson contends that most applications of this approach tend in practice to focus on the person component (Nelson, Whitener et al. 1995). This would concur with the Lending Advisor experience in which a great deal of effort was put into training and management of expectations so that individuals could and would perform on a personal level.

The mentor program initiative at supervisory level can be seen as evidence of the Lending Advisor team becoming aware and responding to the emergent issue of needs assessment at task level within the different functional units in UK Bank. In order for the Lending Advisor process of loans assessment to be effective, all those in the process, both at branch, regional/supervisory level and in inspections, had to be able to achieve their tasks using Lending Advisor.

However, it is suggested that UK Bank, in common with many other organizations, did not follow through with a process of needs assessment at corporate level. The possible reasons for this are considered in more detail in the final section of this chapter. This sub-section considers the way in which UK Bank needs to develop the content of their training program to embrace their new technologically mediated risk assessment process. Further, it suggests that although McGehee and Thayer's (1961) model provides a useful way of understanding the strategic importance of training, it ignores critical dimensions in organizations - politics and culture. The last part of this section will suggest that these are important considerations because of the situated nature of risk assessment.

Lending Advisor was introduced to a 'greenfield site'; the users/managers therefore had to learn basic IT skills as well as new working practices. Learning the necessary hardware and software skills was seen as a challenge, and induced a varying degree of anxiety among users/managers. This was characterised as 'technophobia' by some, particularly, although not exclusively, the older managers. For many managers, the Lending Advisor training course was their first experience with a computer. However, fear of the technology alone could not account for the degree of stress in the response of the users/managers. Considerable anxiety was also associated with the
realisation that their everyday work practices were going to change dramatically; and shifting levels of confidence in their ability to adapt and survive in this new technologically mediated job.

Whereas training before Lending Advisor focused on reaffirmation and socialising, many of the managers now realised that if they could not grasp the Lending Advisor technology, they may no longer have a career within UK Bank. Although the trainers and LAMs worked hard to smooth the way, the majority of managers understood that this was survival. Loans managers were no longer sure what the corporate skill set consisted of and how they related to it. Because of the time lag between the Lending Advisor 'vision' and corporate strategy, the project team lost the opportunity to embed strategic concepts and discourse.

The politics associated with the issue of corporate skill set were not really addressed during the training courses, except by convincing users that this had to be done. Lending Advisor had to be introduced in order to safeguard the future of UK Bank; there was 'no choice'. This method brought about acceptance of the technology and managed the users' expectations with regard to the Lending Advisor task, but it did nothing to reassure managers about their careers. There was no significant user participation during Lending Advisor's design and development until the pilot was rolled out, nor did any significant debate about the appropriateness of the system prior to its implementation.

### 6.4.2 Managing situated organic learning

The new environment within UK Bank was stressful for managers who had been used to a stable organizational climate and now had to adapt to a context of constant change. The reorientation of training from residential to one-day local modular courses was to prove a far more effective way of delivering training. Orlikowski's notion of 'windows of opportunity' helps understand this as a method of managing change in organizations experiencing fundamental culture and skills shifts (Orlikowski and Tyre 1993; Orlikowski 1996; Orlikowski, Walsham et al. 1996).
Her research indicates that individuals tend to make extended, organic changes to their working practices after a period of training or re-organisation, which then are likely to become embedded in everyday routines. During ‘business as usual’, they tend to be too busy and involved in surviving their daily workload to break off and try something innovative or new. ‘It is therefore, important for organizations to fully exploit periods of interruption in an individual's routine and to recognise it as a window of opportunity for them to embed new working practices that reflect the corporate strategy’ (Orlikowski 1996; Orlikowski, Walsham et al. 1996).

Encouraging ‘tinkering’ (Ciborra 1991; Ciborra and Jelassi 1994) may result in more than an effective learning style; it may also generate unique innovations that make the information system hard for competitors to imitate. ‘Grassroot’ strategies like Lending Advisor may enable organizations to address the issue of competitive standardisation, since they embody unique qualities of the local context in which they were formulated that cannot be copied by competitors. The interpretation offered here extends Ciborra’s (1995) work in this area by highlighting the process of translation that grassroots project, like Lending Advisor, goes through. Ambiguity regarding the positioning of LA in the corporate skill set facilitated this process.

A further source of organic change that emerged during the research was the process of play and the home environment. Managers whose son or daughter used a personal computer at home tended to be far more positive toward the technology and learned to cope more quickly with their new computer-mediated work processes. Many of them said that it had given them something to talk to their teenage children about and made them feel more up-to-date and contemporary which boosted their self-confidence.

Once the managers reached a certain point on their personal learning curve, they became noticeably proud of their ability to use computers. Many commented that it made them feel on equal ground with customers who had used computers for some time. The introduction of Lending Advisor prompted some managers to go out and buy personal computers so that they could continue their IT learning experience at home. In the process, some managers discovered a new interest. One manager described how he had put his family’s finances, their address book and diary on his
personal computer. He went on to say that his wife ‘thinks I’m obsessed...I think she is jealous of my new hobby’ (user/manager TL, March, 1996). Lending Advisor had made this manager’s partner twice a ‘computer widow’!

A further consequence of organic learning at home was that users/managers began to see limitations in UK Bank technology. The personal computers that managers were buying for their homes were more powerful than the systems that they were using at work, and this altered the manager’s perception and expectations. The re-conditioned 386 PCs that were used to run Lending Advisor were a reflection of its early status as a minor project in a functional line. As users/managers IT experience grew and their use of Lending Advisor developed, this 'second-hand kit' now looked just that. If UK Bank were to put their confidence and legitimacy into this slow running, cumbersome tool, they must have a new strategy for human resources. Managers were receiving contradictory messages from many sources but could only wait and witness further rationalisation and redundancies. The next sub-section will examine the positioning of the Lending Advisor DSS with the expertise of human agents.

6.4.3 Positioning Lending Advisor and human agents

It is important that the Lending Advisor users, and their executive managers, not only understand the nature of this technology, but also that their use of and relationship to it be managed. It is suggested here that Lending Advisor needs to be presented as a piece of ‘interpretive software’ as one of its users wisely referred to it. From a hermeneutic perspective, all events have multiple interpretations. Lending Advisor is only one interpretation of risk and of risk assessment. Lending Advisor's users need to be taken through a ‘reflexive learning process’ (Wynne and Lash 1992) and encouraged to challenge its epistemological basis.

This notion 'interpretive software' needs to embrace three further qualities: embodiment, partiality and positioning. Drawing on the metaphor of an artificial limb, or prosthesis, Harry Collins suggests that: 'Computers have to be thought of as social prostheses - replacements for humans in communities. Just as the potential of an artificial heart can only be understood in the context of the body, so the power of a computer can only be understood in the context of the social group to which it
contributes' (Collins 1990). In this situated view of knowledge, technologies are skilled practices, the human is an agent, an actor, not a resource and as such never closes off the dialectic in his unique agency and authorship of knowledge (Harraway 1991).

Seen as a prosthetic, DSS are as part of the making of meanings, not for transcending human experience, but for power-charged communication (Harraway 1991) and smart improvisation (Ciborra 1996). They can extend and support the abilities of the human agent, but should not be regarded as a neutral source of data or interpretation as once suggested by members of the Lending Advisor team. Lending Advisor embodies a way of seeing the world, a rational social order which is both structured and structuring (Giddens 1984).

Collins' metaphor of an artificial heart lets us down somewhat, since it does not convey the essential quality of partiality. If Lending Advisor is to be explained via a bodily metaphor it should be regarded as a prosthetic eye, because 'all eyes including our own organic ones, are active perceptual systems, building in translations and specific ways of seeing, that is ways of life. There is no unmediated photograph or passive camera obscura in scientific accounts of bodies and machines; there are only highly specific visual possibilities, each with a wonderfully detailed, active, partial way of organizing worlds' (Harraway 1991). Vision implies knowledge organised by a unique body; embodiment involves positioning which influences how to see. For example: where to see from; what limits to vision; what to see for; whom to see with? An awareness of positioning raises issues of power and ethics, for example: who gets to have more than one point of view; who gets blinkered; who wears the blinkers; who interprets the visual field? (Harraway 1991).

If one pursues the metaphor of embodied vision with Lending Advisor as prosthetic eye, one quality is missing: responsibility. Each of us has to own our partial view of the world and take responsibility for it. At the moment, Lending Advisor has assumed the role of 'god-trick', the all-seeing, all-knowing presence in UK Bank corporate lending. But this is not sustainable, as managers have to question the Lending Advisor technology and somebody has to take responsibility for its deliberate
positioning in the corporate skill set and the emergent consequences that arise from its use.

UK Bank has the opportunity to develop a learning culture, one which is aware of its corporate skill set and which actively values its human experts. At the moment they appear to be hesitating in their formulation of a deliberate strategy that embraces Lending Advisor. In this time lag, managers inevitably form their own interpretation, and see around them, not a learning culture but a culture that sees its human resource as 'waste' that can be cut away by rationalisation.

6.5 Choosing a future for UK Bank and managing associated risks

The final sub-section considers one of the major challenges arising from UK Bank's use of informing technologies. The concept of relationship banking is reviewed in the light of their new computer-mediated organizational interface. It is suggested that the transformations at work in UK Bank can be seen as typical of broader globalising influences at work.

This section outlines an interpretation of the potential strategic role of Lending Advisor from the position of the case study research. It is the contention of this thesis that UK Bank's corporate strategy with regard to Lending Advisor is still being formulated at different levels within the organization. There are different potential futures held within UK Bank which continue to reflect the notion of deliberate and emergent change.

For example, at the time of writing, the Lending Advisor II team were enthusiastically envisioning the new system based on neural net technology and backed up by organizational changes that would reward creative risk takers. Meanwhile, corporate level strategic initiatives continued to pursue cost containment and rationalisation of human 'resources'. The objectives of the latter initiative stand to undermine the former since, as discussed earlier in the chapter, experienced expert knowledge is a prerequisite for effective use of Lending Advisor.
The outcome of these conflicting forces of change will be 'constituted through the political process that lies at the heart of organizational life' (Knights and Murray 1994). Latour (1987) suggests that these processes can be understood as a shifting 'tug-of-war' between the strengths and weaknesses of the connections in the web of actors, human and non-human involved. Whilst one is aware that these political processes are at work, locating or defining them precisely would be like touching a finger on a reflection in a still pond; distortion would be inevitable. The outcome is likely to emerge as a negotiated point on Latour's 'web' representing a compromise on the continuum between strategic initiatives.

The nature of this compromise, and its subsequent impact on the degree of control and autonomy afforded to Lending Advisor's users, depends upon the market strategy followed by UK Bank. If they want a restricted role in the market, as some senior members of the Lending Advisor team seemed to indicate, a policy based on the logic of credit scoring will carve that out for them. After all, this has been a winning strategy for some companies, for example the telephone insurance company First Direct. In this environment, Lending Advisor's role will gradually escalate from mediating expert decisions to defining them.

However, if they intend to compete for a more diverse market share they will have to sustain a critical level of experienced expertise and allow their loans managers enough autonomy to take creative, entrepreneurial risks. If Lending Advisor is going to support these managers, they need to nurture a learning environment where managers feel confident and can make mistakes. This will mean investing in a continued programme of quality training, particularly focused on the next generation of Lending Advisor users, to ensure that Lending Advisor input renders the database useful. In this scenario Lending Advisor will be regarded as a prosthesis which enables and supports 'smart improvisation', making a valuable contribution to the human agents' dynamic social relations of 'conversation' with their local environment.
6.5.1 UK Bank's market position

For effective use of Lending Advisor, UK Bank have to decide on its position relative to the expertise of human agents. As discussed above, their decision in this respect will be influenced by their market strategy. However, it is the contention of this thesis, that UK Bank's choice of market strategy has been complicated and delayed by the possibility of a further dimension of opportunity; a dimension enabled by Lending Advisor.

UK Bank are the largest and first user of this kind of technology in the UK. Evidence from interviews suggested that they have considerable interest in the new opportunities Lending Advisor offers them in terms of product diversification. Once the Lending Advisor database has matured it could be 'harvested' in many different ways. Senior members of the Lending Advisor project team were quick to point out that commercial lending was a relatively resource intensive business. It was suggested that Lending Advisor would enable UK Bank to exploit the existing customer base and attract further customers by offering new, more profitable services. For example the Lending Advisor database would enable UK Bank to offer an analysis of a proposed business case or specific account activity and, since UK Bank's portfolio represents approximately 23% of the national economy, it could also provide industry and market analysis.

The advantages offered by the Lending Advisor technology, and its potential for generating these highly profitable services, must seem an attractive strategic option in the current climate of cost containment and rationalisation. Indeed, Lending Advisor's charms can only seem greater as UK Bank continues to steadily climb back from its serious losses in 1992. UK Bank currently enjoys second position among the 'Big Four' UK retail banks with pre-tax profit figures of approximately £2.5 billion, with a 25% increase in earnings per share (UK Bank 1996).

If Lending Advisor can offer UK Bank new products and reduce the expense of human resources at the same time, why should they show strategic interest in developing expertise at the level of the loans manager? The next sub-section considers the consequences of over-dependence on the Lending Advisor technology.
by exploring the notion of relationship banking. It will be suggested that whilst Lending Advisor enables a technologically-mediated global transparency which has certain advantages to relationship banking, it also introduces new kinds of risks by decontextualising data.

6.5.2 Global technological transparency vs. local knowledge

One of the strongest and most ritual incantations throughout this period of change was that UK Bank would remain faithful to the creed of relationship banking. This is the principle that 'people bank with people', creating a demand for 'highly tailored banking services to meet the differing needs of large corporate, middle market and small business customers' (UK Bank 1996).

Recent annual reports have emphasised UK Bank's commitment to relationship banking and confirmed its role as the 'backbone' of UK Bank's business. During the case study research the various project teams all stressed that, although Lending Advisor would now mediate many of the loans processes, its objective was to support relationship banking not to supersede it. Indeed, nothing would provoke a stronger reaction than the suggestion that UK Bank was heading towards sophisticated, but essentially 'faceless', credit scoring.

It is suggested that if UK Bank intends to sustain their priority on relationship banking in this new technologically mediated environment, they need to be aware of two important challenges facing them; one of them is associated with the nature of data, the other relates to the way in which computer-based information systems enable a new, reflexive relationship between the local and global. These will now be considered in turn starting with a consideration of UK Bank's previous system of data management.

Detailed data concerning customers was previously held in local branches and only accessible by lenders. If a loan application was within the lender's own discretionary limit that data would remain within the branch. If the borrowing was outside the managers' personal lending limit they would extract pertinent aspects of it which would form the basis of the loan application. This data would then normally only be
seen by the sanctioning risk analyst at regional level and possibly circulated amongst his/her peers in that office. Data generated from the loan process remained isolated in these distributed 'data morgues' and it was this lack of detailed portfolio information that contributed to UK Bank's losses in 1992.

Lending Advisor has generated a global transparency within the UK Bank domestic network. It acts as organizational memory for data derived from loans processes which can be accessed, albeit in a prescribed format, from anywhere in the bank's network. When Lending Advisor assesses risk this historical data forms part of its inductive reasoning thereby addressing many of the concerns about the previous system of risk management.

Although Lending Advisor does present these considerable advantages in data management, there are also disadvantages associated with decontextualising data in this way. These partly stem from a lack of distinction between data and information which has been extensively discussed in information systems research (Boland 1987; Liebenau and Backhouse 1990), and yet does not seem to have been ingested either by the research community or practitioners. As discussed in section 6.5, it is an issue that is particularly important to broadcast when implementing a so-called knowledge-based information system like Lending Advisor.

As Boland (1987) suggests, data are symbols that are appropriated and given meaning by the human agent. Implicit in this is that the human agent has enough expertise and local knowledge to give the data meaning. Following Suchman (1987), it is suggested that meaning is contingent on a complex world of objects, artefacts and other actors, located in space and time which form the essential resource that makes knowledge possible and gives data its sense.

As Ciborra (1996) says, behind the notion of information there is nothing other than experience and attention. In contrast, data is frozen in time: 'The past lurks in the back of even the latest information we can get on-line, while the intrinsically open nature of the future defies any attempt to capture beforehand those micro and macro surprises and breakdowns that punctuate the everyday life in organizations' (Ciborra
1996). Computer-based information systems, like Lending Advisor, disseminate this static data across geographical space, away from the local context where its implications and subtleties were implicitly understood.

The issue of local context is critical to the process of giving data meaning. Senior members of the Lending Advisor project team pronounced that UK Bank does not need geography anymore: 'We are in a world where there are genuinely global industries, for example Ford. You wouldn't hear Ford talking in terms of 'regions', they talk about 'Ford Europe' (assistant director, Lending Advisor project, 1995). Although managers still remain in a certain area for a minimum of three years (UK Bank 1996), that area has increased considerably in size making local knowledge a challenge.

Not only does Lending Advisor free UK Bank from geography, it also relieves them of problems arising from personal over-involvement with customers. They believe that the concept of relationship banking can be re-evoked through technologies like Lending Advisor and Internet banking which enable them to construct an 'electronic fingerprint' of each customer. Instead of being a bottom up process, local relationship banking now appears to be increasingly top down imposing standard models on contingent situations.

Many managers felt that lending was becoming increasingly 'meter-oriented'. Regional office would 'go with LA' rather than acknowledge their expertise. It is crucial that UK Bank prioritise the human agent in decision-making processes. This becomes particularly important in situations of increased environmental complexity and dynamism when executive management frequently need to broaden and intensify their capacity for scanning the environment (Pinsonneault and Kraemer 1993). Loans managers can provide this fluid interaction with the local environment, therefore reducing experienced middle management might prove self-destructive to UK Bank. 'In sum, by wiping out the roots of interpretation and action, the backlash of experience may condemn decision makers to the incompetent use of the surplus of data made available even by carefully designed (according to conventional methods) IS' (Ciborra 1996).
Having discussed the potential risks involved when one does not distinguish between data and information, the section will go on to consider the way in which computer-based information systems intensify relationships between the local and global. Decisions about loans that are made locally assume new consequence once they are mediated by Lending Advisor and distributed across the UK Bank domestic network. The implications of the loans decisions made by branch managers previously only had local relevance. They now influence the other managers' interpretation of risk at other times and in other places. This has the potential to enable and constrain those decisions. For example, managers have the benefit of national data on an industry, but must now justify loans in terms of the parameters set by Lending Advisor based on the historical data about loans made by managers in another time and place.

This reflexive relationship between the local and global is not confined to decisions concerning loan assessment. Executive management have traditionally relied on reporting mechanisms that passed data upwards, often becoming increasingly more abstract and decontextualised. However, in the new Lending Advisor environment the changes that they make in lending policy are subsequently included in the parameters of the system. Senior members of the Lending Advisor team estimated that instead of taking 18 months for a change in lending policy to influence the portfolio, this could be achieved in six months. Through Lending Advisor, lending policy becomes more explicit and apparent, and there is less opportunity for managers to adapt it to the local environment.

Albrow (1996) suggests that the unique way in which computer-based information technologies enable global transparency by disembedding data from time and space, is characteristic of a broader process of globalisation that is currently taking place. They are one medium through which our perception of time, space and relationship to the local are being transformed. The importance of the new reflexive relationship between the local and the global introduced in this section will be explored in more detail in the next chapter through a further consideration of situated interpretation of risk.
Chapter Seven

Reflexive modernisation and the transformation of risk in society

7.1 Introduction

The complex consequences surrounding the introduction of a computer-based information system into a greenfield site during a time of extensive re-organization touch on many different theses and could be interpreted in countless ways depending on how one focuses on them. So far, the case study has been analysed from a local organizational perspective, considering the consequences of using a specific kind of computer-based decision support in a particular organization. The re-conceptualisation of strategy and DSS presented in Chapters Five and Six will now form the basis for an analysis of Lending Advisor in a further novel theoretical context. This chapter aims to re-focus the reader at a different level of analysis, in order to explore the potential consequences of this kind of technology beyond the bounds of the organization: for the individual, the sector, the economy and society.

Although the research project initially set out to explore the computer-mediation of a key work process involving a financial model of risk, it was found that a review of the concept of risk in different discourses highlighted important political, social and economic issues that informed the analysis of risk in the dissertation. Further, the concept of risk has been considered at an abstract level by certain social theorists who have developed a thesis relating to the social construction of risk and identity in society. This provides an interesting theoretical context in which to consider Lending
Advisor, one which has not been widely used by other IS researchers and therefore offers distinctive insights.

In particular, Ulrich Beck's book, *The Risk Society: Towards a New Modernity* (Beck 1992), proved to be a valuable theoretical 'backcloth' against which to explore the consequences of computer-mediated interpretations of risk and to consider risk assessment as a situated process. Beck's work has been influential among European social theorist including, for example Anthony Giddens (1991) and Martin Albrow (1996), Scott Lash (1993), Brian Wynne (1996). ‘Ulrich Beck’s coinage of the ‘risk society’ seeks to reflect the importance of the translation of risk from being purely a local matter for individual response to a global concern of profound political significance (Albrow 1996).

The findings from the case study conducted in this thesis will be used to extend Beck’s vision of the ‘risk society’, and in particular his notion of the destandardisation of labour. Beck maintains that a new kind of rationalisation is taking place in the workplace which, enabled by information technologies, takes aim at the classical ordered pattern of modern society (Beck 1992). This second rationalisation is a reflexive rationalisation, in which seemingly ultra-stable organizational boundaries within and between division, sectors and so on, become malleable. As a consequence, we are presented with choices about the kind of future that we want to shape.

The radical impact of computer-based information and communications technologies on modern western society has been compared to that of the printed text. They are modernity’s ‘own media’, bound up in the development and expansion of modern institutions and increasingly mediating our experience of the world, especially certain social and economic exchanges (Giddens 1991). This thesis considers one such exchange in the form of corporate loan assessment.

Beck’s work is a powerful vision of the future and contributes to our understanding of the processes by which modern society may develop; of how modernity may be 'modernised' and what that might mean to us. Although Beck (1992) ascribes information and communication technologies a key role in the transformation of
industrial society, they are not his primary research focus; Beck’s research background is institutional social science. By contributing an informed and updated understanding of the impact of computer-based information systems, the field data in this study presents an opportunity to use Beck’s approach to the social construction of risk and identity in the late industrial society in order to examine the sources, social dynamics, and forms of reflexivity through which the project of modernism may be transformed (Wynne and Lash 1992).

The chapter is divided into nine sections. The first section provides a brief introduction and an overview of the chapter. The second section discusses the status of the claims made in this analysis. The third section defines some of the key terms in Beck’s *Risk Society*: individualisation; the redistribution of the production of wealth and risk; and the de-standardisation of labour. It suggests that the concept of fate, of an omnipotent force directing our lives, has been shaken by the notion that science and technology enable us to intervene and direct our possible ‘futures’.

The fourth section discusses some of the most prominent critiques of Beck’s work by Anthony Giddens, Scott Lash and Brian Wynne, and identifies areas where his thesis could be further developed. The section focuses in particular on Beck’s: conceptualisation of the phases of modernity; preoccupation with risk at the expense of other aspects of social interaction; his ‘realist’ assumptions about human understanding of risk; and finally, that the broad scope of *Risk Society* (1992) which leaves us in need of more depth in order to understand the way in which we should address, for example, the role of information and communication technologies in the risk society.

The fifth section considers the notion of risk management in what is perceived to be an increasingly uncertain world. Lending Advisor is considered as a response to this environment, although one that Beck did not foresee.

The sixth section discusses how the case study material relates to Beck’s notion of the destandardisation of labour in middle management. Beck maintains that the two primary influences currently transforming modern labour are computer-based
information technologies and what he perceives to be new form of rationalisation. It is suggested that the destandardisation of labour in the post-Lending Advisor environment in UK Bank has corroded perceived security in the everyday lives of its users/managers. The study considers the competing conceptualisation of middle management and formulates a hypothesis to explain the contradictory findings in the literature. It is suggested that a hermeneutically-informed conceptualisation of middle management helps us to understand their response to the introduction of technologies like Lending Advisor. There is a focused discussion of the changes in middle management work, as they relate to the Lending Advisor case. This examines the increasing personal and professional riskiness of such work and the implications of a shift in the balance of dependency, autonomy and expertise within UK Bank.

The seventh section then considers how these conditions may influence the situated interpretation of risk in loan assessments. It briefly re-emphasises the important technological and organizational influences that influence and shape decision-making. It also raises other concerns highlighted by Beck's risk society thesis, including up-skilling and dependency on escalating specialist expertise. One further kind of expertise that is needed in the management of technical and economic innovations is, once again, leadership.

The eighth section considers the potential political and economic consequences of the introduction of the Lending Advisor technology for upper and executive management. It is suggested that, although it is possible to implement such technologies higher in the management hierarchy, this move may be met with resistance. This may be a consequence of the 'informating' nature of design and implementation processes involved in technologies like Lending Advisor, which could progressively dispel the illusion of management expertise.

The final section considers Lending Advisor in the context of reflexive modernisation and broader processes of globalisation. It is suggested that both computer-based technologies, and the new forms of rationalisation that they mediate, have contradictory consequences. Like many other globalising forces, for example free market economic theory, they both emancipate and introduce high-consequence risks,
largely or completely unknown before, which transcend their local context. It is suggested that, in conditions of reflexive modernisation, the way in which computer-based technologies like Lending Advisor are managed and used will shape the globalising world.

7.2 The status of the claims made in this analysis

This section considers how Beck's *Risk Society* (1992) is being applied here in order to establish the status of the findings that are presented in the analysis that follows. Beck emphasises that his aim was to attempt to visualise the contours of the risk society as they appeared on the horizon rather than document what was currently going on around him (Beck 1992). The risk society is just one theoretical context in which to view the case material and, as a projection of the future, Beck acknowledges that it is unlikely to materialise exactly as outlined in his book. He emphasises that the social changes explored in *The Risk Society* are happening in a contradictory, non-uniform and disconnected way (Beck 1992).

The assumption upon which this thesis is built is that we are living in a time of relentless change. 'The modern world is a 'runaway world': not only is the *pace* of social change much faster than in any prior system, so also is the *scope*, and the *profoundness* with which it affects pre-existing social practices and modes of behaviour' (Giddens 1991). For this reason, we need to intensify our efforts to understand the world around us, and search for insightful theoretical contexts that help us to reflect upon our world and make some sense of the transformations in process.

The risk society is therefore laid out by way of a hypothesis which helps us to order the findings. The aim here is not so much to 'prove' whether the risk society is here, or not, as this would be contrary to the methodological approach taken throughout the thesis. Our aim is rather to consider and inform some of the fundamental themes in Beck's work in order to contribute to our understanding, not just of the processes going on around us, but how our actions relate to those changes; to provide a considered and insightful analysis of how our everyday actions can shape the world around us. The hope is that it provides a way of looking at the material that gives us
insights and inspires, but which also gives a context for our own everyday actions and
the role of information systems in society.

7.3 Beck's Risk Society

modernisation and the issue of risk. His central explanatory concept is that of
'reflexive modernisation', and the first part of this section will outline this idea in
some detail. Beck's vision of the emerging risk society is presented as 'empirically
oriented, projective social theory' (Beck 1992). His thesis is that we are witnessing
not the end, but the beginning of modernity - that is of a modernity beyond its
classical industrial design (Beck 1992). He attempts to outline the influences that will
shape this future.

Beck rejects Habermas' notion of modernisation as the Enlightenment project. The
progressive advance of rational thought has not, he contends, led us to transcend
nature; rather, in giving unconditional power to scientific reason, we are generating
new high-consequence risks that make us vulnerable. Further, he argues that post-
modernism is not an acceptable alternative way of understanding and acting in the
world that now surrounds us; we cannot collapse into subjectivism and completely
abandon scientific-instrumental modes of thought.

Instead, Beck proposes that we are witnessing a new era, brought about because
modernity holds within itself the seeds of its own transformation: the process of
individualisation, the redistribution of the production of wealth and risk, and the
destandardisation of labour. Since these are major themes in Beck's work, they will
be briefly outlined, before considering in detail how the destandardisation of labour in
particular relates to the case study in this thesis.

7.3.1 Reflexive modernisation: individualisation

Looking back in history, one can see that feudal roles and traditions were superseded
by those of industrial society, namely the nuclear family and wage labour. Beck
argues that the welfare state dissolves dependencies, relations and institutions by
providing a standard of living that releases people from the traditional commitments
and consciousness of class stratification, family and gender. Emphasis has been put on individuals to sustain and advance themselves by entering the labour market. This process of individualisation progressively releases agents from traditional structural constraints. In the emerging post-traditional environment, individuals have more freedom to choose how to live their life within society, and this actively shapes the modernisation process.

7.3.2 Reflexive modernisation: the redistribution of the production of wealth and risk

The second key theme in Beck’s reflexive modernisation thesis is the belief that the industrial and scientific developments that have taken place in modern society have put wealth production above risk production. Beck defines the concept of risk in a particular way in order to make his thesis. 'Risk may be defined as a systematic way of dealing with hazards and insecurities induced and introduced by modernisation itself' (Beck 1992). He suggests that we now face a set of risks and hazards to our existence that have never been faced before, and which will dominate the next period of our history. The distinctive quality of these risks is that they are no longer bounded by time and space, for example the Chernobyl atomic accident. The phrase that he constructed to communicate the transformation in risk is: poverty is hierarchic, smog is democratic (Beck 1992). Beck asserts that a transformation in our logic is necessary ‘...while in classical industrial society the ‘logic’ of wealth production dominates the ‘logic’ of risk production, in the risk society this relationship is reversed (Beck 1992).

7.3.3 Reflexive modernisation: the destandardisation of labour

The third aspect of reflexive modernisation is the destandardisation of labour and this forms a major theme in the next part of the chapter. Industrial society has traditionally been conceived of, and organized around, an employment system centred on the concepts of firm, job, career and wage labour. Beck maintains that information technologies and new forms of organizational rationalisation are dissolving the standard spatial and temporal assumptions about work. Computer-based information and communication technologies enable many work processes to be independent of geography, and allow organizations to construct more flexible working arrangements. These innovations are not, however, leading back towards the traditional goal of full
employment. Instead, Beck argues, they are serving to generalise underemployment, pluralise contractual relations and change the visible character of work previously recognisable by offices in dedicated buildings with associated 'front stage' paraphernalia. So occupation, like the family, has lost many of its former assurances and protective functions (Beck 1992).

7.4 Critiques of Beck

Since Beck's work rose to prominence in 1992 it has attracted a set of critiques in which the strengths, weaknesses and opportunities for development of his work have been discussed (Goldblatt 1996; Lash, Szerszynski and Wynne 1996). Indeed, this process has been embraced by Beck and in 1994 he published a book called Reflexive Modernization in which he engages the sociologists Anthony Giddens and Scott Lash in a mutual critique of each other's work on this common theme.

In the Risk Society Beck touches on many important sociological issues which he draws together into a rigorous analysis of modernising society. It provides an interesting theoretical 'backcloth' against which one can explore many of the critical issues in society and has inspired contributions from a diverse set of authors; for example Jane Franklin's collection, The Politics of Risk Society (1998).

The criticisms of Beck's 1992 thesis may be broadly categorised into the following areas: Beck's conceptualisation of the phases of modernity; preoccupation with risk at the expense of other aspects of social interaction; his 'realist' assumptions about human understanding of risk; and finally, that the broad scope of Risk Society (1992) leaves us in need of more depth in order to understand the way in which we should address the role of information and communication technologies in the risk society. This sub-section will address each of these areas in turn.

The term 'reflexive modernization' has been challenged by Giddens (1994) for, in his view, it implies a 'clear direction of development' in modernity which gives the wrong impression. In his opinion it should be emphasised that we face far more confusing circumstances in which 'there are no longer clear paths of development leading from one state of affairs to another' (Giddens 1994). He highlights the many
contradictions that we see around us, for example the way in which information and communication technologies enable many businesses and relationships to transcend national boundaries, yet at the same time a resurgence of ethnic and national identities (for example, the Kurds or Scottish nationalism). For these reasons, Giddens (1994) prefers the term ‘institutional reflexivity’.

Wynne (1996) further criticises Beck’s use of the term ‘reflexive modernization’ because it give the impression that challenging expert knowledge and traditional institutions is a novel phenomena of late modernity. Reflexivity, Wynne says, has always been active between lay and expert bodies, what is distinct about its current manifestation is the shifts that we are witnessing in agency, identity and dependency. The thesis that follows in this chapter is developed using Beck’s original term, reflexive modernization, to refer to the broader process of change in society, and explores the uncertain development and contradictions referred to by Giddens. However, when referring specifically to the changes taking place within institutions, Giddens (1994) term institutional reflexivity is used. The term helps us to focus the way that the Lending Advisor case study highlights the transformations taking place within organizations, particularly financial institutions, and the new labour relations which are being imposed.

Giddens and Lash (1994) both criticise Beck’s original thesis for giving the impression that our society is only a risk society. Lash (1994) suggests that Giddens’ (1991, 1994) concept of active trust helps us to discover other interesting and important mechanisms that are shifting around us in society. This kind of trust has to be won and actively sustained, for example intimacy that does not rely on locality to bind. It is significant, both for the way it reveals an area for further development in Beck’s risk society and also for the way it relates to an analysis of the Lending Advisor case study.

Active trust is an insightful concept which informs our understanding of the processes involved in emerging social and labour relations. It also points to a way that UK Bank employees could understand and manage the new ethical spaces that are opened up by computer-based technologies like Lending Advisor. In a post-traditional
society, identity and relationships may have to be chosen and actively sustained, in this context organizations like UK Bank cannot depend on established employee loyalty. As discussed in section 7.6, the breakdown of middle management loyalty may have profound implications for UK Bank.

Lash (1994) offers a further critique of both active trust and Beck's risk society which connects with the concept of situated decision-making proposed in this dissertation. Lash (1994) maintains that active trust is not just about making rational choices or challenging 'expert systems' as Giddens and Beck have suggested. It also has a hermeneutic dimension. In the absence of traditional roles, individuals are increasingly constructing their identity from extra-institutional, cultural sources. Active trust is not, therefore, constructed and maintained in a vacuum. We are situated agents, soaked in our various cultures and therefore active trust is not just a matter of rational choice, but involves a broader process of reflection and interpretation in which 'quintessentially modern myths and narratives' (Lash 1994) will play an important part.

Indeed, it is the scientistic or rationalistic epistemology that seems to underlie Beck's approach to the risk society which has attracted the most criticism. Embedded in his definition of 'reflexivity' and 'ambivalence' is a fundamentally rational and cognitive understanding of how human agents appropriate their social world. This has important implications for how Beck conceptualises everyday lay actors, institutions and politics.

'The point is that a theory such as Beck's...virtual neglect of the cultural/hermeneutic sources of the late modern self entails at the same time a neglect of this crucial dimension of politics and everyday life. It means further that [his] conceptions of 'sub-politics'...focus on the experts with relative neglect of the grassroots. It means for [him] a concentration of the formal and institutional at the expense of the increasing proportion of social, cultural and political interaction in our increasingly disorganized capitalistic world that is going on outside of institutions'. (Lash 1994)
Lash therefore argues that Beck's (1992) analysis is 'not so much flawed as partial because of a scientistic character of [his] assumptions'. The implications of this will be explored in this chapter which will present a hermeneutically informed analysis of the Lending Advisor case study which draws upon the notion of competing definitions of risk presented in the literature review. It further explores the implications of a shifting dynamic within UK Bank between specialist, local lay expertise and abstract technical knowledge (or to use Giddens' term 'expert systems') that accompanied the introduction of Lending Advisor. Although Lending Advisor has formed the focus in this dissertation, it should be emphasised that the scope of the thesis in this chapter is on the broader social changes that it highlights.

Giddens (1994) denies that the changes going on in society now are the result of computer-based information technologies, insisting instead that it is the expansion of institutional reflexivity, developed against the backdrop of a post-traditional order that is bringing about change. In their role as mediums for institutional reflexivity, information and communication technologies provide an interesting focus for its study. As discussed in the previous chapter, the strategic 'drift' of the Lending Advisor project within UK Bank highlighted the way in which a computer-based information system enables change and mediates shifting sets of power relations.

In this chapter we will consider the way in which the broader context in which Lending Advisor has been introduced impacts its use. It was apparent in interviews that managers were looking beyond the workplace for a way to understand their position in the changes that were going on around them. Lending Advisor encouraged some managers to use computers at home, particularly for internet access. This extra-institutional experience was important to the way they understood both Lending Advisor and their new role within UK Bank.

The increasing speed, scope and profundity with which computer-based information and communication technologies (including media such as television, film and radio) are providing us with cultural 'fodder' with which to make choices, construct our identities and shape our realities has been neglected in social theory (Thompson 1995). It is, therefore, important that studies such as this are conducted in order to
provide us with a better understanding of the role of information and communications in the transformations that are taking place in society. Further, a hermeneutic approach which embraces the aesthetic and cultural enables us to better understand the changing status of work as a source of identity and stability in our lives.

The significance of this study is made all the more relevant since it expands an aspect of Beck’s thesis that has previously been neglected. In *The Risk Society* (1992) Beck provides a compelling analysis of the ecological crisis currently facing the world. He pursued the latter in a further book entitled *Ecological Politics in an Age of Risk* in which he focuses on systemic environmental degradation. Beck developed his work on institutions and individualisation in a book written with Elisabeth Beck-Gernsheim called *The Normal Chaos of Love* (1995) which focuses on love, family and personal freedom. However, he has not yet elaborated his work on destandardisation of labour, the transformation of organizations and labour relations.

Further, although Beck ascribes information and communication technologies a key role in the transformation of industrial society, they have not been the primary focus of his research. The Lending Advisor case study data extends and updates our understanding of the impact of information systems, particularly on the social construction of risk and identity in the late industrial society.

One of the ‘buzz’ words of the 1980’s was telecommuting, and in *Risk Society* Beck stresses the radical impact that it could have on the future of organized labour. He emphasises the way in which ‘microelectronics’ de-couples standard assumptions about time and space. This would occur due to ‘the gradual abandonment of large-scale work buildings, which, like the dinosaurs of the industrial age, would more and more serve only to remind us of a dying epoch’ (Beck 1992). However, although the flexibility that laptops and telecommunications afford us has proved useful, it has not yet revolutionised organized work on a large scale.

The UK Bank managers looked forward to the day that they could take a laptop on customer site visits. One of the aspects of Lending Advisor that they found most frustrating was the way that it tied them to their desk. They had to make additional
commutes into work and/or stay late in the evenings, which meant missing out on family rituals like shared meals or children’s bed times. A laptop would give them the flexibility to work at home and organize this work outside prime ‘family time’.

When the UK Bank managers were asked what their job would look like in the future, most of them involved some vision of the ‘mobile manager’ who spent all his/her time out on the road meeting with clients and ‘hot desking’ at a central base only when necessary. Although research is yet to support a significant shift on the revolutionary scale predicted by Beck (1992), evidence from the Lending Advisor case study suggests that it may become a more important feature of working life in the future.

Apart from telecommunications, Beck’s other technological concern was robotics and their potentially radical impact on global employment levels. Again, this was a prevalent issue in the 1980’s and, thus far, they have not realised Beck’s prediction of causing mass unemployment. Considerable development effort was concentrated on cybernetics during this period, but it was found that robots were not sufficiently flexible and could only be used in limited contexts. However, robotics was only one branch of artificial intelligence under research in the 1980’s.

Although the search for artificial intelligence has been compared by Dreyfus and Dreyfus (1986) to ‘alchemy’, in the process of searching for the 'holy grail' of intelligence, computer scientist discovered many useful tools. Among them were the advanced modelling techniques which forms the basis of the Lending Advisor ‘engine’. Issues surrounding the rational nature of this kind of computer-based technology have been discussed in the previous chapter; therefore this chapter will consider the consequences of what Beck has referred to as the ‘second rationalisation’ in which LA enabled and will aim to extend his thesis by adopting a hermeneutic approach to the analysis.
7.4.1 Heightened perception of risk: the hermeneutic dimension

In our discussion of risk in Chapter Two, it was suggested that we live in a 'runaway world' where the pace of change around us is bewildering and new risks seem to be invading our consciousness demanding a response: newly discovered health risks like AIDS; environmental disasters like Chernobyl; and increasing threats to personal safety, not just in inner cities, but in quiet Scottish villages like Dunblane.

'Economic insecurity, especially in the job market, makes daily headlines. The environment, health, personal safety and even the planet Earth itself appear to be under attack from enemies never before encountered....A worldwide network of media and telecommunications ensures that the consequences of these events are no longer constrained by their location. The recent development of 24hr global money markets witness ripples of anxiety with every major crisis' (Bernstein 1996).

In his description of the reasons for the emergence of risk management tools above, Bernstein makes reference to a heightened perception of risk in society and the role of information and communications technologies in the dissemination of that sensibility. The cultural or aesthetic is, therefore an integral but implicit, part of his genesis story in the manifestation of risk management tools, like Lending Advisor, within financial services. The debate about the rationality or irrationality of the financial markets is an interesting one (Tversky and Kahneman 1981, 1986, 1992; Tversky 1990). The stance taken in this thesis is that risk tools were developed in part for rational reasons, but also partly as a reflection of changes in cultural values.

In recent history, the concept of fate, of an omnipotent force directing our lives, has been shaken by the notion that science and technology enable us to intervene and direct our possible 'futures'. We now have a sense of multiple futures and try to work towards the most desirable one. The generalisation of risk, and its consideration in our everyday actions, is linked to the emergence of insurance in multifarious forms: life insurance, home insurance, pensions, even the rise of the welfare state. These mechanisms are all designed by human experts to intervene in nature to help us achieve a preferred future. Lending Advisor was UK Bank's assurance that they could manage the risk in their environment.
Although our perception of a generalisation of risk is drawn in part from our cultural context, particularly via information and communication technologies (including media such as television and film, as well as the telephone and internet), most attempts to respond to risk adopt a scientific, rational approach. This includes not only most developers of information systems and risk management policy makers inside financial institutions, but also, as we have seen, sociologists like Ulrich Beck.

One of the themes in Beck’s *Risk Society* is the publicly contested nature of the expertise on which risk assessments rest. Beck suggests that the disputes among experts witnessed by the public, either first hand or in the media, breaks down the traditional scientific hegemony which had inspired unquestioning trust in the past. According to Beck, the lay public now has to make rational choices and take calculated risks about whom to trust which effect their everyday actions: for example whether to eat British beef or to wear sun screen outdoors; whether or not to have a Downs Syndrome test when they are pregnant; whether to stay with an employer or to give up their pension option and leave.

The extension of this kind of rational-calculative approach to risk in society is manifested in Michael Mandel’s (1996) work who suggests that transformations in the financial model of risk may provide us with a way of managing risk in our everyday lives. This way of conceptualising how human agents understand the world around them follows the ‘cultural dupe’ model of the lay public. It suggests that public responses have changed from non-reflexive to reflexive calculative, in other words from total acceptance to deliberately judged and allocated trust.

This thesis, proposes, with Lash (1994) and Wynne (1996), that public relationships with expertise and its institutions have always been reflexive, though in a more thoroughly hermeneutical sense than the rational-calculative model in Beck’s *Risk Society* (1992). Human agents attune themselves to their everyday social context, a process that involves some rational-calculative choice, but which also has an important hermeneutic, cultural dimension.
Beck’s virtual neglect of the hermeneutic sources of the late modern self implies a neglect of this crucial dimension of everyday life. Unless the hermeneutic and cultural are acknowledged, alternative forms of collective knowledge (Wynne 1996) and of organizing human agency may be systematically suppressed.

What are the consequences of scoping out the hermeneutic cultural dimension? The way in which we define a concept like risk reflects an epistemological ordering with a corresponding network of power interests. As Perrow (1984) suggests in his extensive study of *Normal Accidents: Living with high-risk technologies*, the dominant approach to risk assessment in our society reflects a rational, calculative marketplace theory of cost-benefit analysis.

‘Risk assessors have a narrow focus that frequently supports the activities of elites in the public and private sector. They argue for the importance of risk, but limit their endorsement of the approved risks to the corporate and military ones, ignoring risk in social and political matters’. (Perrow 1984)

Intangibles like the impact on community tend, therefore, to be scoped out of the risk assessment process. Perrow’s message is that sensible living with risky systems means keeping the controversies alive, listening to the public and recognising the essentially political nature of risk assessment. ‘Ultimately, the issue is not risk, but power; the power to impose risks on the many for the benefit of few’ (Perrow 1984). Perrow aims to raise awareness regarding the way in which this is done: there is either no public debate about the criteria used in risk assessment, or a highly controlled one.

In Beck’s conceptualisation of grassroots or lay public expertise there is ‘never the slightest hint that there could in the public realm be the basis of alternative forms of public knowledge, and order, from those given in existing forms of instrumental expertise’ (Lash 1994). All the attention is given to the scientific or expert knowledge groups and what limited reflexivity is afforded to the lay public is inadequately restricted to the intimate and interpersonal (for example Beck and Beck-Gernsheim 1995).
It is important for this thesis that we not only acknowledge an increasing perception of risk in our everyday lives, but also emphasise that everyday people are responding and reflecting upon this. This is, therefore, a thesis that is interested in the emergence of high modernity, but which focuses on *low modernity*, in which a sense of high modernity both analytical and hermeneutic has, for the first time, spread to the masses of people in every part of social life (Lash 1994). Our attention is not just on institutional reflexivity, but also on 'reflexive community' and the consequences of its marginalisation and suppression in the current definitions and management of risk. This is explored through the concept of the situated nature of risk assessment discussed in the last chapter in the context of reflexive modernity and the transformation of risk.

7.5 Risk management in an uncertain world

This section will discuss Lending Advisor as a response to heightened perceptions of risk in the global environment. It is suggested that the potent combination of new forms of rationalisation, enabled by computer-based information systems like Lending Advisor, adds to this uncertain environment by corroding perceptions of security in everyday life. This increasingly risky environment adds new dimensions of risk into the loan assessment both at an individual level and an organizational level. These new risks, generated by this second rationalisation in collaboration with technological experts, may have significant consequences at sector, national and international levels. An awareness of these high-consequence risks fuels the general perception that we live in a risk culture, dependent upon ever escalating levels of specialised expertise.

7.5.1 Lending Advisor as a response to innovations in the financial sector: a new risky environment

Lending is an inherently risk laden financial process at the 'coal face' of its business, subject to the volatility in the national economy. However, until recent years, the UK banking sector had been protected from the further risk of major competition within the industry by the UK political environment. As outlined in earlier chapters, the UK banking sector was a relatively stable environment for almost two hundred years. It then became enveloped by two powerful man-made constructions: the free market innovation and technological advances.
The free market concept abhors monopolies and the major retail banks were a highly regulated virtual monopoly. A series of steps led to de-regulation legislation, in 1986, which changed the environment in which those institutions operated. The financial services industry was exposed to competition across a broader range of products, blurring the distinctions between the different types of financial institutions, like banks and building societies.

This economic innovation was not confined to Britain. Governments around the world became convinced by free market economics and the notion that markets have an intelligence of their own. Advocates believe markets left alone to act freely will reach an intelligent status quo or equilibrium. As a result governments implemented programs to free their markets, especially the financial markets, thereby increasing global competition and exposure to volatility. The capitalist free market environment creates economic ‘winners’ and ‘losers’ which has fuelled the conditions of hypercompetition (Zuboff 1996) currently being experience by the UK Banking sector.

Regulation of the banking industry was not the only barrier that had protected British banks from potential competitors. The major UK clearing banks also had extensive branch networks and control of the primary method of funds transmission, for example the clearing houses and BACS. Technological innovations, such as EFTPOS and ATM’s in the 1980’s, were instrumental in constructing a common electronic infrastructure that broke down these barriers.

The emergence of free market political policies, de-regulation and advances in technology can all be seen as phenomena unleashed by human experts. They have created conditions that, arguably, now require further specialist expertise to be developed in order to deal with the consequences of those innovations. It is suggested that Lending Advisor be seen as part of this process of escalating specialist expertise and technological advances.
The emergence of Lending Advisor as part of UK Bank's risk management is an example of the shift in the relationship between the 'logic' of wealth production and the 'logic' of risk production discussed in Beck's *Risk Society* (1992). This became apparent during interviews with senior project managers. It was suggested that Lending Advisor could seriously skew the UK Bank portfolio. Drawing on the Boston Consultancy Group's metaphors: in getting rid of the 'dogs' in the portfolio, they could also risk losing the 'stars', and end up with a bland portfolio. As a result, they could lose their strong position in the UK market.

Instead of refuting this, the assistant project director pointed to the risky market conditions: 'The shareholders want the bank’s portfolio skewed towards the safer end of the risk spectrum, and want to avoid being exposed to volatile market pressures. This does raise issues regarding market size. [UK Bank] has had 25-30% of the UK market. By reducing their risk spread, they may be challenged in this respect, but the shareholders prefer a steadier return for their investment' (assistant director, Lending Advisor project, 1995). UK Bank's response to the substantial losses that they sustained in this new risky environment, therefore, was to put consideration of risk before market growth, and they exploited advances in decision support technologies to this end.

Having considered Lending Advisor as representative of a change in UK Bank's perceived utility of risk versus wealth, the following sections will discuss how their recent strategy of rationalisation has contributed to the destandardisation of labour. A key feature in this process was the enabling capacity of the Lending Advisor computer-based technology.
7.6 Lending Advisor, the destandardisation of labour and corrosion of perceived security in everyday life

In an echo of Beck's notion of the destandardisation of labour, UK Bank followed up the implementation of Lending Advisor with a programme of radical organizational rationalisation; a second rationalisation. As mentioned in the introduction to this chapter, this second rationalisation is a reflexive rationalisation, in which seemingly ultra-stable organizational boundaries within and between division, sectors and so on, become malleable. As a consequence, we are presented with choices about the kind of future that we want to shape, for example opportunities to change company policy regarding the governance of the workplace. The Lending Advisor study highlights this second rationalisation, in particular the competing definitions and conceptualisations of middle management which underpin and motivate local actions within organizations. It is suggested that the way in which these choices are manifested in local actions will, in turn, shape the way in which labour relations emerge in our globalising society.

Beck considers modernization a process of rationalisation. One expression of the ‘first’ rationalisation occurred when Frederick Taylor’s philosophy of scientific management gripped the commercial world. The principles of Taylorism are based on a belief that the fragmentation of tasks within a functional hierarchy, and separation of the ‘thinking’ from the ‘doing’, is the most efficient way of managing work processes. The banking sector embraced this philosophy whole-heartedly and, between the 1950’s and 1980’s, the major UK retail banks typified this form of organization.

Local bank managers are a particularly interesting occupation to study in the context of risk society as they highlight a shifting dynamic from traditional to post-traditional, destandardised labour. Defining the role of a traditional local bank manager within the spectrum of management structures draws us into competing concepts and definitions of middle management. Before the introduction of Lending Advisor and the organizational changes associated with it, local bank managers within UK Bank were referred to as senior management, a status that many cherished. Any suggestion that they were middle management tended to be met with a questioning look and quick reference to their official title. Yet, traditional bank managers fit the broad
definition of a middle manager quite well. Broussine and Guerrier (1983) suggest that middle management are organizational members who supervise other organizational members; have authority over an organizational unit; discretion over resources; and are not members of the executive group reporting directly to the chief executive officer of the organization (Geisler 1993).

In order to understand the local bank manager's cultural response to the notion that they are middle management it is necessary to consider the traditions, rhetorical devices and ideological constructions that emerged within British management in the latter part of this century. The traditional culture within the Big Four retail banks was characteristic of British management as a whole, which was dominated by hierarchical segmentation that sustained a system of distinctive managerial specialism (Reed and Anthony 1992).

'The position and standing of management within British society seems to have changed relatively little since the industrial revolution...it had become deeply embedded in a centuries-old technique and culture of rule which emphasized stability at the expense of innovation, and compromise at the expense of confrontation. The political and organizational weakness of British management was reflected in its reliance on a model of 'status' rather than 'occupational' professionalism.

(Reed and Anthony 1992)

The reign of such rational management practices was further legitimated by the dominant approach to management education over the last thirty-five years. This presented a rational-technical conceptualisation of management in which competencies tended to be listed, emphasising a narrow vocationalism in which the technical and functional skills were highly valued (Burgoyne 1989). Many top management seized upon this expression of the scientific management concept, insisting that middle managers were subject to formal education programmes, through bodies such as the Chartered Institute of Bankers, which embedded this rational view. These education programmes helped constitute a sense of expertise through cultural capital and technical knowledge. Most middle managers rushed for its legitimisation in
a bid to conform to top management values and improve their chances of promotion (Hallier and James 1997).

The economic decline during the late 1980s stimulated a number of reports (e.g. Handy 1987) aimed at improving the provision of management education in the UK. These documents and initiatives highlighted the ‘underlying ideological tensions and contradictions between an enterprising or entrepreneurial value system on the one hand, and a professional or status and control-oriented strategy on the other’ (Reed & Anthony 1989). In 1988, Handy et al wrote:

‘The conclusion is inescapable that in Britain management education and training is too little, too late. The British have rationed something which should be universally available and turned a potentially common good into a special reserve. What should be a prerequisite for all managers has become a perk for the minority. The result is, in some areas, a spurious elite’.

Despite attempts to shift the assumptions underlying the rational-technical conceptualisation of middle management (Reed & Anthony 1989), it has persisted. Indeed, Taylor’s principles were in evidence during the 1980s and early 1990s, when top management plunged into downsizing in order to bring about a rapid reorientation in company strategy. Middle management came under threat, but why were they considered so dispensable?

The rational-technical conceptualisation of middle managers characterised their role as informational; merely the bureaucratic go-between from top management to operational staff and vice versa. Herbert Simon argued that the majority of middle management decisions could be made just as well by computers, since they were essentially repetitive and required ‘little of the flexibilities that constitute man’s (sic) principal comparative advantage over machine’ (Simon quoted in Wheatley 1992). With computer-based information technology being heralded as the ‘driver’ for business process reengineering and downsizing, top management began stripping layers of middle management out of the corporation to create a flatter, ‘leaner’ structure.
The way that middle management had been conceptualised by colleagues, educators and the academic literature, coupled with their own tendency to conform to this definition of their role threatened their very existence. Dopson and Stewart (1993) note that 'Most writers portray the middle manager as a frustrated, disillusioned individual caught in the middle of a hierarchy, impotent and with no real hope of career progression.'

In the late 1990s organizations are starting to recognise some of the less desirable consequences of downsizing (Geisler 1993; Noer 1993; Pinsonneault and Kraemer 1997). The downsizing literature has revealed some interesting contradictions between the intended fate of middle management and their actual endurance within many organizations. For example, in 1988, Kodak eliminated 12,000 employees, most of which were middle managers in, in order to become leaner and flatter; they subsequently fell behind in product innovation and production (Burris 1994). Over time it has emerged that ‘the elimination of middle management in corporate downsizing risks damage to an organization’s process capability which might worsen, rather than improve organizational performance’ (Floyd and Wooldridge 1997). Corporations frequently find that after downsizing they have to re-employ middle managers on an expensive consultancy basis in order to remain competitive. New products and services designed to lead corporations out of decline require administration and co-ordination, which tends to result in a gradual restoration of middle management numbers.

What was it about the rational-technical conceptualisation in both management practice and the academic literature that was missing? Why have middle managers proved difficult to live without? The majority of the middle management academic literature has not helped us make sense of this situation. The first challenge is finding such literature, for as Torrington and Weightman (1982, 1987) note, middle management in the public and private sector have tended to be overlooked by researchers. As Geisler (1993) notes:

‘The puny body of literature on middle managers treats this group primarily as an identifiable category of organizational members,'
distinguishable only by its hierarchical location. Moreover, research on middle managers generally does not focus on this particular group's specific attributes. Rather, researchers use middle managers to explain inputs to the behaviour of other organizational groups or variables.

If academic researchers do include a definition of middle management, and some don't (for example Geisler 1993), it tends to be very broad as do the findings; for example: 'Broadly speaking, therefore, managers in boundary-spanning sub-unites have more upward strategic influence than others, but the point here is that different managers exert differing levels of upward influence at different times' (Floyd & Wooldridge 1997). The way in which middle managers are conceptualised varies between papers, yet the underlying assumptions behind the research are rarely made explicit to the reader. Most middle management studies have adopted a rational cognitive approach which aims at isolating characteristics, key variables or factors using a positivist methodology.

The studies tend to be cross-sector and conducted by survey, rather than longitudinal, interview-based case studies (for example, Wheatley 1992). The subsequent quantitative analysis aims to measure trends, rather than understand how managers interpret and respond to the changes taking place around them. As a consequence, past research leaves us with contradictory and inconsistent findings across multiple studies (Wheatley 1992; Dopson and Stewart 1993, 1993a; Geisler 1993).

For example, there have been extensive debates about the impact of technology on employment which have mostly focused on automation of manual work in manufacturing industries. In their 1964 study, Leavitt and Whistler (1964) argued that a combination of management science and information technology would cause middle management to shrink, top management to take on more creative functions, and large organizations to centralise. In contrast, more recent case-study based research on the impact of information technology, for example (Wheatley 1992), suggests that in many cases it has led to a reshaping and enriching of the middle management role rather than to its decline (Dopson and Stewart 1993). How do we construct an analysis of the impact of the Lending Advisor project on middle management in the face of such contradictions?
The first step is to try and understand why these contradictions have emerged. Firstly, Leavitt and Whistler’s study (and many that followed it) treat information systems in a deterministic way; the inference being that ‘IT’ would bring about these changes to middle management. In contrast, current research emphasises that while computer-based information systems enable change, it is the way that the human agents develop, implement, manage and use the information system that determines the outcome; not just a case of ‘add-IT-and-stir’ as suggested by Leavitt and Whistler.

Further, they treat information and communication technologies as monolithic phenomena. Yet, technologies differ quite considerably in their application, for example personal computers; Unix systems; internet; intranet; databases; and groupware (Montiero and Hanseth 1996). When one takes into consideration the range of technologies and the range of contexts into which they may be introduced, one has to accept that a range of outcomes is likely (Attewell and Rule 1984; Pinsonneault and Kraemer 1997).

It is suggested here that these contradictions may also reflect a deeper epistemological issue that surfaces not only in the academic literature, but also in the practice of management in organizations. It is that the rational, cognitive approach adopted by the majority of the academic literature on middle management tends to conform to, and reinforce, the hegemony of scientific-rational interest groups in organizations. If we can conceptualise middle management in an informational role, where they perform routine, repetitive bureaucratic tasks and exist in a ‘social vacuum’ we make them susceptible to replacement by the computer. The seductive modern myth of the computer is one cultural conduit through which scientific-rational expertise has come to be seen as more valid than local, specialist lay expertise.

The tension between scientific-rational expertise and lay public expertise is a major theme in Beck’s risk society thesis. It is suggested here that unless we broaden our conceptualisation of middle management in order to embrace a more hermeneutically informed approach we are limiting our understanding of their role. We are conforming to the scientific-rational epistemological order that has dominated western society and which is currently in the process of being challenged by reflexive modernisation. The majority of middle management research is still being conducted according to the traditional categories of the industrial society. Further, although the
risk society literature has highlighted the destandardisation of labour, it has missed this a crucial epistemological tension currently being expressed in the modernization of labour relations.

As discussed earlier, Beck’s risk society thesis does not adequately address the reflexive nature of local specialist, lay knowledge and, in particular their continuing capacity, in situations of dependence, to exhibit ‘as-if’ trust. It is suggested here that recognition of the situated, hermeneutic response of middle management will not only help us understand the potential consequences of introducing technologies like Lending Advisor into organizations, but will also highlight an aspect of the risk society that has so far been overlooked. To this end the next part of this sub-section will present an alternative conceptualisation of middle management which emphasises their role as negotiator and interpreter within a local community.

The manager’s job has ‘generally been treated either in isolation or as part of a mere list of roles’ (Mintzberg 1994). Mintzberg (1994) sees the components that make up the job of managing as ‘integrated, infused, and well rounded’. Further, he maintains management at its most effective could be understood as blended care, especially in contrast to the all-too-common style of management as interventionist cure. His work gives a sense of the richness with which the work and the style of managing can be described. Mintzberg concludes by emphasising that we still have a long way to go in understanding the job of a manager.

It is suggested here that a hermeneutic approach may reveal other dimensions to middle management that have considerable strategic importance. If overlooked their absence could prove damaging to a corporation’s long term future. Although their research does not explicitly explore the cultural or hermeneutic theoretical context, there are author’s who have attempted to go beyond the rational-technical conceptualisation of middle management in order to better understand their role in organizations.

In contrast to the informational role described above, these author like and Anthony and Reed (1989) and Pinsonneault and Kraemer (1997), maintain that middle
managers perform interpersonal and decisional roles which draw upon processes and information not amenable to computerisation. They detail, further define and disseminate information about objectives, policies and structural changes formulated by top management. As Pinsonneault and Kraemer (1997) note: ‘Middle managers mediate between top and operations level managers by communicating and interpreting policies downward to operations managers, and by monitoring and aggregating detailed information from operations upward in a form useful to top managers’ (my emphasis).

Far from being conceptualised as ‘fat’ or ‘waste’, middle management make important contributions to strategy (Floyd and Wooldridge 1997). They do this by integrating and aligning organizational competencies; providing unique interpretations of emerging issues to top management; proposing new initiatives based on their practical, local knowledge of a situation or process; evaluate existing approaches and programs; and translating goals into actions. It is suggested that middle management have an important role in monitoring the external environment, interpreting ambiguous, diverse data from multiple local sources and strategically aligning the organization in a responsive way. In particular, they mediate, negotiate and interpret relationships between the organization, its customer and suppliers. Important social and economic exchanges occur in the process of these interactions that foster a sense of interrelationship.

This conceptualisation of middle management provides a sense of the middle management’s role in the construction of organizational culture through the negotiation of concerns and problems in everyday practices. A sense that organizational culture emerges as much through practical actions as from abstract planning. Middle managers are in a position to enact strategies and embed the new values, norms and beliefs. However, despite this practical orientation, naive comments are often made about what middle managers should do, for example the desirability for information sharing, informality and flexibility throughout the firm (for example, Floyd and Wooldridge 1997). There is little acknowledgement of the politics between managers, the way in which they interpret and construct meaning in
their ecology, in other words the totality of the situated hermeneutic process that middle managers experience.

Burgoyne (1989) maintains that ways should be found to expand the political, moral and ethical dimension in management education programs in order to recognise the holistic nature of management; 'the inevitability of a large element of judgement in its assessment, the variability of management across situations' (Burgoyne 1989). The technical conceptualisation of management is misleading in an environment where so much adaptability and flexibility are being demanded. He also calls for further and more thorough, exploration of the construction of organizational culture and management leadership. Little thought has been given to the differing motivations behind corporate strategy or the complex interests that might shape the way that it emerges.

This would demand some philosophical awareness of the importance of values, an awareness that tends to be overlooked by traditional organizational theories. The ethics that Burgoyne is referring to are less about legal issues and more about relationships and responsibility:

'...while they deal with right and wrong decisions, they frequently involve factors that make the right and wrong less than patently clear...The difficulties seem to arise over differences of interest (between family and business reputation), conflicts over the application of a value (loyalty to the group versus loyalty to the head of the group), conflicts between values (truth versus human welfare) or conflict between codes of conduct (company policy versus professional standards). Managers report that such issues are typical and difficult'. (Reed & Anthony 1989)

The acknowledgement of competing conceptualisations of middle management highlights the different choices and motivations that can underlie the strategies of top management and find expression in the academic literature. For example, Scase and Goffee (1989) suggest that the future of middle management will be shaped by tendencies polarising the structure of modern management:
‘...the commitment, motivation and job satisfaction of middle and junior managers may be severely eroded as they become even more excluded from participation in the decision-making processes surrounding the specification of major corporate objectives...they may be now developing more instrumental and calculative attitudes towards their employing organizations...there is an increasing polarization of management tasks within large-scale organizations...[this has] reinforced the concentration of decision-making among limited numbers of senior managers responsible for longer-term corporate strategy...’

They maintain that this will lead to a growing divide between, on the one hand, senior executives and, on the other, middle and junior managers. The former will increasingly appear to monopolise strategic decision-making, while the latter are delegated routine administrative duties which are subject to tighter measures of performance (Scase and Goffee, 1989).

Adopting an alternative conceptualisation of middle management, Zuboff (1988) suggests that:

‘The re-integration of conception and execution within the ‘mega-corporation’, made possible by information technology and its organizational consequences, will produce new foundations for managerial authority based on a commitment to expand collective intellectual knowledge and skills, rather than to re-establish control over the organization’s knowledge base so as to preserve hierarchical power.’

An awareness of these competing conceptualisations also enables us to form a unique interpretation of the Lending Advisor project. On the one hand, as discussed in the previous chapter, the business team envisioned a process of empowerment and smart improvisation whereby Lending Advisor provides middle management with access to new kinds of data. Middle management could then appropriate that data and endow it with relevance and purpose drawing on their local knowledge and expertise. Lending Advisor could help them uncover previously unknown details relevant to management
decisions and consequently middle managers could have richer roles, make more complex decisions and analyse more alternatives in greater depth than before.

On the other hand, top management identified an opportunity to increase their control over decision-making in credit risk and reduce middle management by capitalising on that portion of the informational roles that could be automated. This would support Pinsonneault and Kraemer's (1997) reinforcement politics perspective, which posits that the impact of computing depends upon who controls key structural arrangements and whose interests are being served by computing.

'Top managers and middle managers are two such coalitions. When top managers are in control, computing can be expected to serve their interests. Top managers are interested in greater ability to respond to external pressure which is aided by efficiency, whereas middle management are interested in preserving or expanding their domain which is aided by enhanced capabilities.'

(Pinsonneault and Kraemer 1997)

It is suggested here that a hermeneutically-informed risk society thesis might provide a context in which the actions of both top management and the bank managers might be better understood. When the Lending Advisor technology was introduced, the LA team emphasised that UK Bank had no choice but to respond to external competitive pressures in this way. Hallier & James (1997) note that organizations are increasingly abandoning the traditional job-for-life labour relations in favour of temporary, flexible, performance related contracts. One way of understanding this response is the heightened perceptions of risk that have emerged in society. Top management feel threatened by new risks in their ecology and suddenly morality becomes subsumed by survival rhetoric. Conditioned by a management education and culture dominated by rational conceptualisations of middle management and a narrow cost-benefit approach, they look to contain costs. Relationships, traditions and trust all fall by the wayside in the bid to survive this new hostile environment. The balance of dependency, autonomy and expertise begin to shift in a way that presents opportunities for emancipation, but also generates risks to the role and identity of middle management and consequently the long term future of the organization.
Hallier & James (1997) note that the employment relationship is currently beset by tensions, in particular the disillusionment and anger of middle manager affected by the demise of their job security, career opportunities and in the equity of their treatment (Manning, 1992; Noer, 1993; Roskies & Louis-Guerin, 1991).

‘What has emerged is a complex picture of the loyalties and motives of managers located at the centre of the hierarchy; a picture that at one and the same time presents middle managers as loyal to senior officials and as willing to subvert formal policies where they are opposed or are deemed peripheral to their immediate goals and activities....

An unprecedented number of middle managers have been made redundant in the 1990's. There is a significant trend within the financial services sector as a whole towards part-time, flexible working arrangements. Yet, there are almost no opportunities for these managers within UK Bank to re-skill or reduce hours and become part-time. Indeed, it is unclear whether, if these kind of opportunities were available, they would be seen as acceptable to the managers. The overwhelming majority of these managerial redundancies are men. Part-time flexible working arrangements have tended to be entered into by women. The process of individualisation, emphasised by Beck (1992), releases women from traditional roles and into the labour market. In the historic time lag between men's continued conformity to the traditional role as full-time providers and women's gradual emancipation from the home, we are witnessing the emergence of a gendered organization of work, particularly in the financial services.

In this era of restructuring, redundancy and outsourcing, professional and managerial workers have been put in a position where they are forced to endure the intensification of work; greater workloads, longer working hours and the demise of their traditional job security.

‘In addition, the preferential treatment once afforded all managers has diminished and become less easy to distinguish from the conditions of subordinate workers. This has signified not only change to the content of jobs, careers and security but a transition between contractual agreements
formed to sustain the employment relationships of managers in an earlier era and those now favoured to support emergent organizational strategies. In this context of change and uncertainty, the psychological contracts of middle managers may be critical for explaining their reactions to these new arrangements. (Hallier and James 1997)

Hallier & James (1997) describe the implementation of a programme of organizational change in an air traffic control centre. They found that performance related contracts raised the stakes faced by middle managers. This weakened a crucial link in the psychological contract between middle and top management and made it subject to rupture. Middle managers struggled to seize opportunities and defend their security through concerted attempts to control the impressions of top management. This tended to lead to greater interpersonal rivalries, less considerate treatment of subordinates and, ultimately, the subversion of corporate aims (Hallier & James 1997).

Their work provides insights into the way in which middle managers are responding to ‘a new climate of attrition’ (Hallier & James 1997). When faced with competing obligations, managers predominately attempt to meet the expectations of senior management in order to circumvent personal risks associated with working under the new regime (Hallier & James 1997). Their findings suggest that middle manager’s willingness and ability to subvert organizational strategy and day-to-day policy may be considerable where they perceive themselves to be in a climate of personal and professional insecurity and sense their own futures are at risk.

7.7 Lending Advisor and the transformation of risk in a 'runaway society'

The depressed state of the labour market had a considerable influence on the acceptance of Lending Advisor and its consequences. Trades unions seem helpless to prevent fundamental changes happening to standard work arrangements. There is now a ‘generalisation of employment insecurity that was not known in the ‘old’ uniform full-employment system of industrial employment...Progress and immiseration interpenetrate each other in a new way’ (Beck 1992). Managers may
have gained potential flexibility of working arrangements through higher discretionary limits for their own personal lending and perhaps eventually from the introduction of laptops, but at what cost? As Beck says, 'Working people's gains in sovereignty over their work can be combined with a *privatisation of the physical and mental health risks of work* through spatial flexibilization of labour' (Beck 1992).

It is suggested that the process of reflexive modernisation, with its consequences of destandardising labour and generalisation of risk, have considerable influence on the process of situated risk assessment. The rational nature of the Lending Advisor computer-based decision support system further adds to, and exacerbates, new and unforeseen dimensions of the risk assessment process. This section will consider risk assessment as a situated process in the context of reflexive modernisation, and in particular the destandardisation of labour. The next section will then attempt to show how these new, high-consequence risks generated by the technologically mediated rationality represented by Lending Advisor, may have impact on the banking sector and the national and international economy.

In the traditional, paper-based risk assessment process on corporate loans the manager received a proposal or business case. S/he would analyse the cashflow and supporting documents and interview the potential customer which would perhaps involve a visit to their business site. The manager would then decide whether or not to sanction the loan based on the perceived risk as calculated by him/herself. The loan would either be within the manager's own discretion, in which case it was immediately approved, or it would be referred to a higher authority within the risk structure who would critique the manager's assessment before approving or declining the loan. The degree of success or failure of the loans made by the manager would reflect upon their reputation and that of their branch.

Managers were naturally risk averse; the satisfaction of gain is always going to be less than the regret of loss. Bernstein (1996) uses the metaphor of building a brick wall to explain a risk averse mindset. The foundation layer of this wall is formed from big bricks, but every layer after that is built from smaller and smaller bricks. Any brick you remove from the top of the wall will be larger than the next brick you might add.
to it. The hurt that results from losing a brick is greater, therefore, than the satisfaction that results from gaining a brick.

Before Lending Advisor, if a loan defaulted this loss was justified in terms of an unfortunate turn in the market, crime or fraud, an Act of God, or lack of judgement by the loans manager. Whatever the conclusion, the reason for the loss was local to the environment of the loan and the decision made about the loan.

In a risk assessment supported by Lending Advisor, the manager goes through a similar process to above: s/he is handed a business case or relevant statistics (e.g. cashflow), the customer is interviewed and visited. This data then has to be loaded onto Lending Advisor, which according to the research field data can involve many additional hours of labour. Most of the managers interviewed said that they would usually have formed an opinion about the case before entering it on to Lending Advisor. They are unlikely to spend hours entering data if they are convinced that the loan will not be viable. The time taken to load cases therefore represents an additional barrier, or disincentive, to assess a loan that will not go smoothly through Lending Advisor’s categories or fit with its parameters. If the loan does look OK to the manager, and s/he invests the time in loading it, most managers said that it tended to confirm their original prejudice about the case.

When the manager’s risk assessment concurs with Lending Advisor, it has a number of consequences. It serves to confirm Lending Advisor in the mind of the manager and in the view of the organization; it also confirms the parameters of the system for the developers. Next time the same decision comes up, if all other weightings on the system are the same, Lending Advisor will advise the manager to make the same decision. A positive result, therefore, confirms both the expertise of the manager for selecting the loan, and the expertise of Lending Advisor for supporting it.

If a manager loads a case, and finds that Lending Advisor differs in its risk assessment, the manager now has to assume the additional risk of contradicting Lending Advisor. Before Lending Advisor, the failure of a loan could be justified in terms of the local environment. This post-mortem would usually be carried out some
considerable time after the loan had been issued. With Lending Advisor, the manager not only has to assess all of the traditional influences, but also has to consider the interpretation of Lending Advisor. In the traditional, paper-based loan assessment, the manager could take full responsibility for a success; now that success is shared with Lending Advisor. Whereas before the manager could attempt to explain or justify it when a loan later defaults, s/he now has to take full responsibility for the failure, since Lending Advisor forewarned him/her of this likelihood at the time that the loan was made. This serves to intensify the inversely proportional relationship between gain or loss captured in the image used earlier of the wall made of ever smaller bricks.

So, by its very existence as part of the manager’s everyday risk assessment, it represents an added disincentive to take on risky or problematic cases that do not fit neatly into Lending Advisor’s categories. Conversely, a positive result now has more implications for the organization, but less for the individual. Before Lending Advisor, the success was attributed to the individual. Now Lending Advisor is part of that success. UK Bank faces the problem of ‘positive feedback’, whereby ‘multiple feedback from a system’s own outputs continuously modify, and amplify, elements, processes or sub-systems within itself...[and] carry the actual state away from some ‘reference state’ that was chosen to identify the system’ (Angell and Smithson 1991).

The intervention of Lending Advisor into the manager’s risk assessment has altered the stakes. It has altered the terms and scope of the risk interpreted by the manager. This situation is intensified by performance-related, commission oriented contractual arrangements. More of the entrepreneurial risk involved in making a loan that does not conform to Lending Advisor’s parameters, is assumed by the manager in a shift that could prove to have high consequences not only for UK Bank, but for the nation's economy and the way modernity is being shaped.

7.7.1 High consequence risks associated with Lending Advisor

The consequences of the decisions that are made with Lending Advisor are no longer just local, they are distributed over time and space. Positive or negative results do not just reflect on the manager and his/her branch. The results of the decisions will be fed into Lending Advisor, and either reinforce its parameters or prompt its analysts to
change them. Thus a decision, that was previously local, now potentially influences
the lending behaviour of managers nationally. Information on loans was traditionally
held within branches; indeed, this lack of access to information was said to have
contributed to UK Bank’s over-exposure in the property market. This data is now
digitised and held on a central database, which is used to inform and influence not just
other loans, but also the formation of national bank lending policy.

Lending Advisor and tools like it may, therefore, change the pattern of investment in
the UK. This could have profound effects on the economy by systematically denying
capital to certain sections of industry. The managers had already identified a number
of areas that did not meet with Lending Advisor’s criteria and which were extremely
time consuming to assess. These included small businesses, film production and bio­
tech research and development companies. These areas have enormous potential
value to the British economy, and are vulnerable to the notorious ‘brain drain’
overseas.

Although post-modern social theorist would have us believe that the cultural-political
hegemony of scientism, and its one dimensional modernity is finished, the ‘dominant
discourses for all their nods in the direction of liberal pluralism, remain firmly
instrumental and reductionist’ (Wynne and Lash 1992). The way in which UK Bank
implement Lending Advisor could stand in confirmation of this. They have a choice
about how to manage it, but the danger is that, in their romance with rationalism, they
overlook that Lending Advisor is based on an idealised models of risk. These models
assume that the future can be predicted from historic data, a point which has been
extensively debated since the time of Aristotle.

In his book, Against the Gods: the remarkable story of risk, Peter Bernstein traces the
development of these models of risk, and acknowledges the achievements of those
who have pursued such models. However, he also reminds all those who would place
undue faith in such models that they remain fallible and vulnerable, as we all are, to
the caprice of nature. Nature has confounded risk assessment throughout the ages and
that is what we should never forget when dealing with tools like Lending Advisor
which embody these idealised models. As the novelist and essayist G.K Chesterton put it:

‘The real trouble with this world of ours is not that it is an unreasonable world, nor even that it is a reasonable one. The commonest kind of trouble is that it is nearly reasonable, but not quite. Life is not an illogicality; yet it is a trap for logicians. It looks just a little more mathematical and regular than it is; its exactitude is obvious, but its inexactitude is hidden; its wildness lies in wait’. (Chesterton, quoted in Bernstein, 1996)

Lending Advisor supports decision making using historical data. We have already discussed the way that this data might become biased by the way in which Lending Advisor now changes the manager’s interpretation of risk before it even enters the organization. But Bernstein would warn us further about this over reliance on historic data: 'Once again, resemblance to the truth is not the same as the truth.' (Bernstein 1996).

7.7.2 Dependency and escalating specialist expertise

An important aspect of the high-consequence risks highlighted by Beck is that they render us dependent upon an escalating level of specialist expertise. In the previous chapter, it was suggested that Lending Advisor de-skills a particular layer of middle management. However, although it may de-skill at this level of management, in order to use Lending Advisor effectively, UK Bank needs more specialised and highly skilled analysts higher up the hierarchy to set the parameters of the system and ensure the feedback process is of a high quality. Beck maintains that ‘The principle of division or, better, destruction of labor is replaced by the counter-principle of the consolidation of partial tasks on a higher level of skill and specialized sovereignty’ (Beck 1992).

It seems that the consequences of expert attempts to minimise risk in our environment can only be managed by further developments of specialist expertise. And yet the issue of 'up-skilling' does not end with a bewildered population watching, helpless as 'Progress' chases its own tail, like a playful dog. For not only do the high-
consequence risks under discussion have a new type of, potentially global, social and political dynamism, an important aspect of the up-skilling issue is specialism.

This brings us back to Walsham's (1993) theme of leadership, discussed in previous chapters. Part of the current crisis in the financial sector is that, having introduced specialist computer-based information systems into their key business processes, executive management may no longer understand these processes anymore or what their technical experts are doing. Rogue technocrats have been allowed to operate in the financial markets without management control, and part of the reason that this has happened is because their managers have not had enough technical knowledge to monitor them.

With many countries basing their national information technology policies around the concept of an 'information society', this concern is not just limited to commercial operations (Lyon 1995; Webster 1995). Beck suggests that the independence of scientist and technologists undermines democracy. 'In the eyes of the technological elite, the majority of the public still behaves like engineering students in their first semester....They only need to be stuffed full of technical details, and then they will share the experts' viewpoint and assessment of the technical manageability of risks, and thus their lack of risk. Protests, fears, criticisms, or resistance in the public sphere are a pure problem of information. If the public only knew what the technical people know, they would be put at ease - otherwise they are just hopelessly irrational' (Beck 1992).

Beck's concern about the global nature of high-consequence risks and outrage at the lack of responsibility brought to bear on the authors of the innovations unleashed on the world, leads him to propose that scientists and technologists should be under the control of democratic government. In the mid-1990's, when government intervention in most western countries, and most particularly the United States, is running at an all time low in popularity, this seems an unlikely turn of events. It is more probable that complacency will reign until certain of these high-consequence risks come home to roost. The 'Year 2000' problem has been a particularly interesting example of high-consequence risk in this respect, highlighting as it does the technological numbness of
both management and government in the face of some very articulate technical specialists.

Unless the actual realisation of high-consequence risks make government intervention a necessity, on the scale proposed by Beck, their consequences are likely to be managed outside the conventional democratic mechanism. Two likely proposals are considered here. Firstly, within the traditional management structure in organizations, the European phenomenon of the 'hybrid manager' may grow in value and popularity. The problem with this idea has always been that there are not enough individuals with this varied career progression and that those who do, tend not to put themselves in the corporate firing line to the extent that is needed.

Secondly, outside the traditional management hierarchy, the recent trend for team work and group work may hold potential for managing high consequence risks by dealing with complexity at the point at which it enters organizations. This suggestion, however, does not address the critical issue of leadership. Proposals for who, what, where and how this is done are somewhat beyond the scope of this thesis, but high-consequence risks have to be managed if we are to have an economically and environmentally 'healthy' tomorrow.

In her plenary speech at a conference on information technology and changes in organizational work, Zuboff reflected on corporate and government information society and globalisation rhetoric and concluded: 'An information economy requires more than infrastructure investment. It requires a new social contract derived from a new moral vision, binding members of the firm together in ways that contrast profoundly with the well worn emotional pathways of the industrial hierarchy. Until these matters are seriously engaged by the leadership in a majority of our business organizations, the notion of an information economy is much like the foolish emperor of fairy tale fame, naked and very much at risk' (Zuboff 1996).

Policy statements on some relevant ethical and political issues do exist in corporations. For example, after the Lending Advisor project, UK Bank issued a statement on Family Values emphasising the company's commitment to family life;
and recent shareholders meetings at Shell Petroleum witnessed battles to have a human rights clause included in its mission statement in the wake of Ken's death in Nigeria. Although such statements are written, they are frequently seen as rhetoric, and often contradict with the day-to-day enactment of business practices which are embedded in company culture.

Whilst the world listens and dismisses radical proposals such as Beck's, computer-based information systems are being introduced higher and higher up in the traditional management hierarchy. The next section examines Zuboff's work (1988, 1996) in more depth and considers how the upward march of technology could have direct implications for the shape and content of the executive management and leadership hierarchies in corporations and government.

7.8 The informing capacity of DSS and its impact on traditional management hierarchies

This section considers the potential political and economic consequences of the introduction of the Lending Advisor technology for upper and executive management. It is suggested that, although it is possible to implement such technologies higher in the management hierarchy, this move may be met with resistance. This may be a consequence of the 'informating' nature of design and implementation processes involved in technologies like Lending Advisor, which could progressively dispel the illusion of management expertise.

Zuboff's work is particularly insightful here. She suggests in her book, *In the Age of the Smart Machine: The Future of Work and Power* (Zuboff 1988), that: 'As information technology is used to reproduce, extend, and improve upon the process of substituting machines for human agency, it simultaneously accomplishes something quite different. The devices that automate by translating information into action also register data about those automated activities, thus generating new streams of information....It provides a deeper level of transparency to activities that had either been partially or completely opaque. In this way information technology supersedes the traditional logic of automation....Activities, events and objects are translated into
and made visible by information when a technology *informates* as well as *automates* (Zuboff 1988).

Computer-based decision support technology may be seen as part of an upwards progress of technology within traditional hierarchies in organizations making the work at each level more transparent or as Zuboff says, informating. Early uses of technology focused on automation with the aim of removing the physical labour of work. The focus of technological innovation then moved from automation of manual manufacturing and production process to management information systems, which then developed into computer-based decision support systems predominantly used by middle management, and further upwards to executive information systems.

As Moore and Chang (1983) note, the 'client' who orders a computer-based decision support system, is generally distinct from the decision makers who use it (Silver 1990). 'Managers commonly impose DSS on their subordinates, usually for the purpose of influencing the subordinates' decision-making behaviour' (Silver 1990). The 'backroom systems' introduced in the UK Banking sector during the 1960's were acceptable to middle management, so long as they were used by the 'girls and boys in the office' and gave the managers greater capacity to control and survey the work of subordinates. Economic pressures forced those same middle managers in UK Bank, decades later, to submit to the introduction of computer-based decision support systems. What leverage might incline upper and executive management to concede to a similarly informating process? And why should they?

As mentioned earlier, automation often mediated what Beck has described as the first rationalisation, inspired by Taylor's scientific management and Ford's production lines, which aimed at dividing the thinking from the doing. Breaking down work processes in this way removes complexity. Traditionally, managers were the 'guardians of the organization's knowledge base' and they received, interpreted and communicated orders based on a command of this complex information (Zuboff 1996). Although computer-based information systems sometimes increases the dimensions of complexity in organizations, they also open up opportunities for complexity to be dealt with at the point where it enters the organization, whether that
be the customer interface, the point of production, or in the act of service delivery (Zuboff 1996).

If an organization wants to create customer-facing, self-organizing teams, as for example UK Bank has stated it wants to, it will have to ensure that the organizational knowledge base is accessible to those who need it. The consequence of this is recombining the 'thinking' with the 'doing'. Zuboff suggests that this may break down the old power relations related to that division of labour, a shift that has the potential to create a new social contract within organizations (Zuboff 1996).

Beck maintains that techno-economic innovations could be the motor for permanent social change (Beck 1992). Indeed, Shoshana Zuboff predicts that, in the next twenty-five years or so, partly as a consequence of the upward march of informating technology, the managerial hierarchy as we know it will have been dismantled and the purposes and functions of organizational membership will have been profoundly reconfigured (Zuboff 1996). Computer-based decision support systems could be seen as one of the critical junctures in this progression.

Now that computer-based information systems have landed on the desks of middle managers in UK Bank, the next development appears to be executive information systems. Indeed, members of the UK Bank EIS team were interviewed towards the end of this research study although, typically, none of them felt that the acceptability of the system being developed was their responsibility. How might the introduction of computer-based information systems at executive management level challenge power relations? Is there evidence of Zuboff’s new social order emerging or are management hierarchies successfully side-stepping the possibility for a re-distribution of power?

In his response to Zuboff’s paper at the IFIP 8.2 conference (1995), Hugh Willmott considered how upper levels of managers may respond to the possibility of their work being made transparent. It was his contention that they will not allow systems to be built that will challenge their power and authority. For this reason, he argued that within the capitalist paradigm that we currently live in, the new social contract that
Zuboff talked of will not emerge in the 25 year time frame that she suggested. Certainly there is much literature that suggests that computer-based information systems confirm the status quo, rather than radicalise power relations, and academia's track-record of predicting the impact of technological innovation on society has been unimpressive.

However, perhaps Willmott is underestimating the radical force of the transformations that are taking place through reflexive modernisation. All that can be said for now is that the outcome is in the hands of those implementing the technology. They, not the technology itself, will shape the future. In this respect, Zuboff's emphasis on the persistence of existing power relations in her earlier work may come to haunt her: 'The absence of a self-conscious strategy to exploit the informing capacity of the new technology has tended to mean that managerial action flows along the path of least resistance - a path that, at least superficially, appears to serve only the interests of managerial hegemony' (Zuboff 1988).

7.9 **Lending Advisor as part of reflexive modernisation and broader processes of globalisation**

Far from being a Luddite treatise, this thesis has attempted to appreciate the positive risks, or opportunities, offered by computer-based technologies like Lending Advisor. Emphasis has been put on the potential flexibility that laptops could introduce into current work practices; the benefits of electronic transmission; organizational memory; and making data accessible to decision-makers. However, even those who hail advances in the academic economic theories underlying Lending Advisor acknowledge that 'the science of risk management sometimes creates new risks even as it brings old risks under control. Our faith in risk management encourages us to take risks we would not otherwise take. On most counts, that is beneficial, but we must be wary of adding to the amount of risk in the system' (Bernstein 1996).

The significance of computer-based decision support systems, like Lending Advisor, is that they not only provide 'evidence for discourse and resources for political play' (Introna 1997) in organizations; depending on how they are managed, they may also mediate a process of destandardisation of labour, which will influence situated
interpretations of risk. They actively influence decision-making and the responses of managers; in ways that were intended and also in ways that were unintended. It is suggested that, in the case of Lending Advisor, this will shape the organizational landscape within UK Bank that is emerging out of the ashes of centuries old tradition.

However, in the process of reducing the overall riskiness of loan assessment for UK Bank, expert innovations like Lending Advisor and the rationalisation that it mediates may introduce new risk parameters, largely or completely unknown before, which transcend the local context of UK Bank. These parameters include high consequence risk, such as decontextualising local loan assessment in order to achieve computer-mediated global transparency of data: risks deriving from the globalised character of the social systems of modernity’ (Giddens 1991). This creates a need for further specialised expertise both higher up in the organization and in global society, expertise that may not have been developed yet.

The Lending Advisor case study highlights DSS being used as an organizational resource, and therefore the subject and object of political activity. Indeed, Introna (1997) contends that they only exist at the level of political activity. He suggests that computer-based 'decision support systems are politically significant but not hermeneutically significant' (Introna 1997). However, the finding of this thesis suggest that Lending Advisor both influences the way in which human agents appropriate information and, further, that its political 'positioning' (Harraway 1991) within the organization is likely to have direct relevance to the way in which human agents interpret situated risk.

If we understand hermeneutics as a search for the 'truth' (Gadamer 1975), then DSS are nowhere close to representing the 'truth' about a company for the manager. As discussed earlier, they are better understood as representations of 'frozen organizational discourse' (Bowker and Star 1994). However, it is suggested that they are an important part of situated hermeneutic, a constant slippage of interpretation between the manager and his/her context, of which Lending Advisor is now an integral part, that occurs in order for the manager to reflexively interpret their social, political and economic status in the world.
We are living at the dawn of a ‘global age’ (Albrow 1996), the contours of which are being shaped by a risk culture in which we live side-by-side with risk that is distinctly different from other eras (Beck 1992; Giddens 1991). The concept of risk has become ‘fundamental to the way both lay actors and technical specialists organize the world...Under conditions of modernity, the future is continually drawn into the present by means of the reflexive organization of knowledge environments...thinking in terms of risk is vital to assessing how far projects are likely to diverge from their anticipated outcomes’ (Giddens 1991).

The re-organization that accompanied the Lending Advisor DSS, and was partly mediated by it, broke down centuries of tradition. This process has the potential both to emancipate and birth new forms of risk. For example, on the one hand this is causing the demise of a standard profession that, until recent years, had marked out local communities. On the other, it seems to be part of a broader process of individualisation in society, which gives both UK Bank and the managers themselves the opportunity to interpret their role in new ways. If Beck’s thesis of reflexive modernisation is to be believed, this interpretation will shape the emerging world around them.
Part Four
Conclusion

- Strategy formulation in practice
- Re-conceptualisation of DSS: smart improvisation and DSS as prosthetic eye
- Risk society as a context for understanding computer-mediated interpretation of risk
- Competing definitions and concepts of middle management
- Implications of the hermeneutically-informed interpretive methodology
- Further research

Figure 8.0 Summary of Part Four
Chapter Eight

Conclusion

8.1 Introduction

For the purposes of this concluding chapter, a synthesis has been constructed from selected themes within the dissertation which, it was felt, had the most potential for increasing awareness and contributing to IS theory and practice. The chapter is divided into four sections. The first section introduces the chapter and presents an overview of its organization and structure.

The main areas of contribution are outlined in the second section of the chapter. The major contributions from the LA research project can be summarised as the re-conceptualisation of strategy and DSS considered against the novel theoretical 'backcloth' of the risk society. The theoretical context of a hermeneutically-informed risk society enabled a re-conceptualisation of middle management which contributes to our understanding of the impact of technologies like Lending Advisor and their role in the transformation of modernity. The contributions are organized in four sub-sections which guide the reader to some of the supporting evidence from the Lending Advisor case study.

The third section in the chapter focuses on the implications of using a hermeneutically-informed interpretive methodology and discusses the way in which it enabled a unique analysis of the Lending Advisor case study. The fourth section discusses the limitations of the thesis and points to areas of further research.
8.2 Key themes in the dissertation

8.2.1 Strategy formulation in practice

Strategy can be interpreted as the practice of managing positive and negative risks in the relationship between an organization and its ecology. Like risk management and insurance, strategy has risen in importance since the demise of the concept of fate. It is a way of identifying multiple futures and consciously working towards a future. This dissertation has helped us to understand how strategy is formulated in practice within organizations and emphasizes the increasing importance of the cultural dimension in realizing strategic goals.

In Chapter Five, a brief review of mainstream information systems strategy literature was presented (section 5.2). It was suggested that the traditional ‘top-down’, rational approach that dominates the IS literature, fosters many management ‘control illusions’. Further, this traditional conceptualization of strategy did not adequately inform action, with the consequence that practitioners tended to neglect certain events and processes that are important to the realization of strategy.

In contrast, Mintzberg’s notion of strategy formulation in practice provides the foundation for a re-conceptualization of strategy which, it is argued, offers many insights which inform action (section 5.2.2). Chapter Five developed and supported this view of strategy using evidence from the case study, with the aim of constructing a re-conceptualization of strategy which would enable us to make better sense of the emerging strategic role of Lending Advisor.

Building upon Mintzberg and Water’s (1985) work, it was proposed that an essential part of the strategy process should be conceptualized as emergent, contingent and constituted by actors throughout the organization. Support for this position was identified among social theorists (Giddens 1991) and interpretive IS researchers (Ciborra 1991, 1994, 1996; Walsham 1993; Zuboff 1988, 1996).

It was suggested (section 5.2) that strategy formulation could be regarded as the creation and maintenance of systems of shared meaning that facilitate action (Walsham 1993). From this perspective, deliberate, abstract strategic plans are only
part of the process. Low level everyday actions and language also play an important role by creating local communities of shared values, norms and beliefs which can either support or undermine the enactment and realisation of strategic goals. It was proposed that the role of leadership and training are particularly important in this process.

The work of Ciborra (1991, 1994, 1996) and Walsham (1993) provided insight into the strategy formulation process which helped make sense of the varying expressions of strategic interest or intent by different stakeholders in the LA project gathered over time in the interview data. The original LA team was drawn mainly from the ranks of middle management. It was suggested that Lending Advisor was an example of Ciborra’s concept of *bricolage*, built up from the cumulative reflections and practical daily know-how of UK Bank middle managers and that this original ‘vision’ had the potential to provide a unique strategic advantage (section 5.3). As Ciborra and Jelassi (1994) suggest, the value of this is to keep the development of a strategic information system close to the competencies of the organization and its ongoing fluctuations in local practice. Further, innovation that emerges in this way tends not to be so susceptible to the kind of competitive standardisation that plagues many industry sectors. The emergence of the LA middle management ‘vision’ supported both Zuboff’s (1988) and Walsham’s (1993) contention that organizations stand to benefit from an enlarged constitution of IS strategists, as it sustains an innovative organizational culture and presence in the marketplace (section 5.3).

Indeed, it was suggested that the level at which the LA ‘vision’ emerged within the UK Bank hierarchy helped us to understand the limitations of the LA project and the potential opportunities and risks that lay ahead for UK Bank (section 5.3 and 6.2). In particular, it helped to understand the gap between the middle management LA ‘vision’ and top management corporate strategy that emerged during the case study research. Chapter Five considered the implications that this had for the management of the deliberate and emergent issues during the implementation of the Lending Advisor decision support system (section 5.4). The central hypothesis offered is that interplay between planned, deliberate strategy and lived, emergent strategy was an important and dynamic relationship which needed careful management as it can have a major impact on the outcome of an IS project (section 5.2.2).
The LA project team was at its most effective when its members incorporated a dimension of reality shaping into their management of deliberate and emergent phenomena during the implementation of Lending Advisor. For example, the historically 'bad' relationship between the remote IT department and business-led project teams was largely overcome by the presence of a senior LA team member who stayed on-site for long periods during the early development and customisation process (section 5.5.1). His enthusiasm for the LA 'vision' generated conviction and provided focused leadership which facilitated the work towards realisation of its goals. After his departure from the LA project team, this reality shaping was not actively sustained and the cultural tensions were allowed to grow again. This was epitomised by the nickname of 'Waco' given to the IT department by later members of the LA team to signify its perceived bid for independence from them (section 5.5.1).

Further evidence of both a conscious and unconscious sense of strategy enactment could be seen in the decision by the original project director to personally open every training session and be present at every closing dinner (section 5.5.2). He also chose 'figureheads' throughout the UK Bank hierarchy to communicate the importance of accepting Lending Advisor and the changes that it would introduce (section 5.5.2). These were high profile, well respected individuals who mobilised support using influential political and social networks within the organisation.

The above empirical evidence, and further data in the dissertation on training, supervision and day-to-day-management (section 5.6.3), supported the hypothesis that there are certain processes and events where strategic goals could be communicated and embedded in a particularly effective way (section 5.2.1). Further, if a massive shift in organizational culture is required, as was the case for the introduction of Lending Advisor, the need for change has to be embedded in the everyday hermeneutic or 'cultural' dimension, as well as the level of calculative choice.

The importance of this situated dimension as a major influence on the introduction of an information system like Lending Advisor, especially in a greenfield site, has been much neglected both in the IS literature and in practice. It was suggested that the
The hermeneutic dimension could be particularly important in understanding a DSS project, because individuals have a reflexive relationship with their ecology and therefore context can have a profound influence upon the quality of their decision-making (section 5.2.1, 6.2, 6.3, and 6.4).

**Key points**

- The concept of strategy formulation in practice is extended and developed
- It is proposed that the need for strategic change has to be enacted and embedded in the everyday hermeneutic or ‘cultural’ dimension as well as at the level of calculative choice
- Events and processes like training, day-to-day management and supervision provide important opportunities for this
- It is proposed that that the interplay between deliberate and emergent strategic issues is an important and dynamic relationship which needs careful management as it can have a major impact on the outcome of an IS project
- The LA case provides empirical evidence to support the proposal that we should value lay knowledge as the basis for strategic innovation (bricolage)
- Further it is proposed that organizations would benefit from an enlarged constitution of IS strategists in order to sustain an innovative culture and presence in the market

**Table 8.1 Key points on strategy**

8.2.2 Re-conceptualisation of DSS: smart improvisation and DSS as prosthetic eye

It was suggested that if DSS are to mediate key business processes, it is crucial to appreciate how they affect decision-making (section 6.3.1). This could have direct implications for the strategic management and use of LA which should make it of particular interest to both middle and top management. Although Silver’s (1990) notion of ‘systems restrictiveness’ provided a useful starting point it was suggested that, in common with the traditional research approach in this area, it treated DSS and DSS users as if in a vacuum. It was proposed that if management and users are to understand the consequences of introducing a DSS like Lending Advisor into a greenfield site, they have to consider decision-making as a *situated activity*.

Since decision-making occurs in a social and political context we have to turn our attention to the way in which human agents respond and reflect upon that context if we are going to understand the impact of introducing a DSS. This is particularly
important in a risk assessment process where loans managers are faced with a highly competitive marketplace in which they need sufficient autonomy to act as entrepreneurs, yet are under constant pressure to ensure that their organization is not exposed to excessive risk. This theme was extended and developed using the work of Zuboff (1988) and Walsham (1993).

Zuboff (1988) emphasises the unique capacity of computer-based information technology to simultaneously enable greater central control, and increased local flexibility over work processes. As Walsham (1993) notes the balance between control and autonomy is of central concern in the formulation of computer-based information system strategy. It was suggested that achieving this balance is particularly important with a DSS project like Lending Advisor and that whether or not this flexibility translates into autonomy was questionable, and depended upon the way in which the information system is managed (section 6.3).

One of the Lending Team suggested that LA was intended to ‘replace the culture of formality within [UK Bank] with one of discipline with regard to lending processes’. LA may encourage managers to conform and become self-disciplining in line with the limitations imposed on them. Managers need to be able to improvise, in order to operate in the market and act when they see an opportunity. The concern with the Lending Advisor DSS is that managers may prove fearful of exercising the option for displaying entrepreneurial artistry.

As Ciborra says (1996) ‘In a market, one finds the key components of improvisation seen as a way of quickly adapting to change: immediacy; situatedness; idiosyncrasy; local knowledge; access to and deployment of resources at hand’. Like the Micronesian seafarers described by Lucy Suchman (1987) in her book Plans and Situated Actions, both the loan managers and UK Bank need to be able to make essential shifts in navigation towards their objective. She contends that ‘the nature of an activity can be missed unless one views purposeful action as an interaction between a representation and the particular contingent details of the environment' (Suchman 1987).
It was proposed that Lending Advisor could support what Ciborra (1996) refers to as 'smart improvisation' if UK Bank sustained a critical level of situated local expertise which could be depended upon to populate the Lending Advisor database. However, this may be problematic for UK Bank in the light of redundancies and early retirements aimed at mature managers. Further, if improvisation is situated, the decline of the branch network and local bank manager inevitably means that their local presence is of a different nature and increasingly technologically mediated.

It was suggested that the growing dependency on decontextualised data held by computer-based information systems, like LA, to inform action and sustain relationship banking was significant for many reasons (sections 6.3.2; 6.3.3; 6.3.4; and 6.6.2). For example, as Collins (1990) notes, computers lack 'inside' knowledge of the local conventions within different human communities. Therefore, whilst they can calculate probability based on historic data, they cannot suggest how to respond to new situations in a new way and are unlikely to create a socially legitimate or effective response to a new situation. If, as proposed, the expert capacity to give data meaning is so dependent upon experience and local knowledge, then the demographic shift taking place in UK Bank's middle management is concerning. By retiring managers over 50 years old the content and quality of the knowledge community within UK Bank will be altered and they risk losing the expert capacity to interpret and critique LA assessments (Orlikowski 1993).

The users of Lending Advisor are finding themselves constrained by pressures of time, of job performance, and the fact that their interpretation is pitched against the legitimacy of LA as representative of policy and ambassador of 'progress'. In this climate of attrition it becomes ever more important that the managers' specialist, lay expertise is strategically positioned within the corporate skill set (sections 6.4; 6.4.1; 6.4.2; and 6.4.3). Its value, relative to the scientific-rational expertise of LA, must be established through training programmes and day-to-day management. Emphasising again the importance of everyday practices discussed in Chapter Five, it was proposed that UK Bank would be well advised to encourage situated organic learning (section 6.5.2).
As Silver (1990) notes, training is an area that is virtually neglected by DSS researchers. There is a general lack of appreciation regarding training as a lever in organizational strategy and change (Gash and Kossek 1990; Nelson, Whitener et al. 1995). There is little research into either the critical strategic issues of training or the social context in which training takes place and is subsequently employed, which have all seemed so critical in the course of the Lending Advisor study. These issues were considered in detail in section 6.5 and particular emphasis was given to the political and cultural dimension of training which was absent in the most widely used traditional models (for example McGehee and Thayer 1961). It was proposed that whilst UK Bank constructed an effective delivery mechanism for LA training, the content still needs further thought.

Management need to consider how and why Lending Advisor might de-skill the loans assessment process and what can be done to ‘remedy’ this tendency. The existing approach tends to present LA as a ‘neutral’ technology whereas, it was proposed, LA users are well aware of the threat that it presents to the status of their local, lay expertise. Whilst this might not be an important consideration in other key work processes, it is of vital concern in a risk assessment process which depends upon confident, situated, local knowledge.

Drawing on the work of Donna Harraway (1991) and Harry Collins (1990) an attempt was made to re-conceptualise the Lending Advisor DSS in a way that highlighted some important issues for future research. It was proposed that Lending Advisor should be presented as a piece of ‘interpretive software’. From a hermeneutic perspective, all events have multiple interpretations. Lending Advisor is only one interpretation of risk and risk assessment. This notion of ‘interpretive software’ needed to embrace three further qualities: embodiment, partiality and positioning. These qualities were explored by introducing the concept of DSS as ‘prosthetic eye’ (section 6.4.3).

It was suggested that DSS were best understood as a prosthesis or an artificial limb which replaces humans in human communities (Collins 1990). Just as the potential of a prosthesis could only be understood in the context of the body, so the power of a computer could only be understood in the context of the social group to which it
contributes (Collins 1990). In this situated view of knowledge, DSS are part of the making of meanings, not a way of transcending human experience, but a means of enabling ‘power-charged communication’ (Harraway 1991) and smart improvisation (sections 6.3.4 and 6.4.3).

It was further proposed that if Lending Advisor is to be explained via a bodily metaphor it should be regarded as a prosthetic eye, because ‘all eyes including our own organic ones, are active perceptual systems, building in translations and specific ways of seeing, that is ways of life [section 6.4.3]. There is no unmediated photograph or passive camera obscura in scientific accounts of bodies and machines; there are only highly specific visual possibilities, each with a wonderfully detailed, active, partial way of organizing worlds’ (Harraway 1991).

Vision implies knowledge organised by a unique body; embodiment involves positioning which influences how to see. For example: where to see from; what limits to vision; what to see for; whom to see with? An awareness of positioning raises issues of power and ethics, for example: who gets to have more than one point of view; who gets blinkered; who wears the blinkers; who interprets the visual field? (Harraway 1991).

If one pursues the metaphor of embodied vision with Lending Advisor as prosthetic eye, one quality is missing: responsibility (section 6.4.3). Each of us has to own our partial view of the world and take responsibility for it. At the moment, Lending Advisor has assumed the role of ‘god-trick’ (Harraway 1991), the all-seeing, all-knowing presence in UK Bank corporate lending. But this is not sustainable, as managers have to question the Lending Advisor technology and somebody has to take responsibility for its deliberate positioning in the corporate skill set and the emergent consequences that arise from its use.

The Lending Advisor study highlighted the anxiety that can be generated when the strategic position of a computer-based decisions support system is not communicated to its users. It was proposed that this omission may be deliberate on the part of UK Bank as top management pause to consider the strategic opportunities for product diversification enabled by Lending Advisor (section 6.6 and 6.6.1). If LA could offer
UK Bank new products *and* reduce the expense of human resources at the same time, why should they show strategic interest in sustaining expertise at the level of the loans manager?

It was further suggested that the way in which managers were left ‘dangling’ generated an epistemological tension within UK Bank which fuelled an excessive sense of personal and professional riskiness among LA users/managers. This tension may have profound implications for the quality of decision-making within UK Bank and it hinges on the following questions: what is the status of the loans managers’ local, lay expertise relative to the scientific-rational expertise represented by Lending Advisor? Which source of expertise will become the basis for policy-making? Which will be regarded as the most legitimate basis of knowledge creation within UK Bank and which should inform practice?

### Key points

- It is proposed that a situated perspective would inform IS practice better than the traditional rational approach, particularly on DSS in risk assessment
- Creativity and improvisation are essential to success in a competitive marketplace. The balance between autonomy and control therefore needs careful consideration when introducing a DSS
- The strategic importance of training for positioning a DSS within the corporate skill set is emphasised. It is suggested that particular consideration needs to be given to the context in which training takes place
- The de-skilling capacity of DSS is explored in detail. Both researchers and practitioners need to be aware of this tendency as it implies important strategic choices.
- A re-conceptualisation of DSS is presented based upon the concepts of ‘smart improvisation’ and DSS as ‘prosthetic eye’. It is suggested that this raises important issues and themes for further research.

### Table 8.2 Key points on DSS

#### 8.2.3 Risk society as a context for understanding computer-mediated interpretation of risk

Although the research project initially set out to explore the computer-mediation of a key work process involving a financial model of risk (section 2.3 to 2.3.5), it was found that a review of the concept of risk in different discourses highlighted important political, social and economic issues that informed the analysis of risk in the
dissertation (sections 2.3.6 to 2.3.8). Further, the concept of risk has been considered at an abstract level by certain social theorists who have developed a thesis relating to the social construction of risk and identity in society (section 2.3.9). This provided an interesting theoretical context in which to consider Lending Advisor, one which had not been widely used by other IS researchers and therefore offered novel insights.

The concept of risk became one of the central explanatory concepts in the dissertation primarily explored and developed through Ulrich Beck’s book, *The Risk Society* (1992). The risk society was presented in this dissertation by way of a hypothesis which helped to order the findings from the Lending Advisor research project (section 7.2). The aim was to explore the light and shade in the landscape of a risk society; highlighting a dimension of analysis in the Lending Advisor study that might have been neglected by traditional IS research approaches, and contributing to areas where Beck’s original thesis left us demanding more.

Beck’s thesis was summarised in section 7.3. Briefly, it has two main themes: reflexive modernization and the issue of risk. His thesis is that we are witnessing not the end, but the *beginning* of modernity that is, a modernity *beyond* its classical design. He attempts to outline the influences that will shape this future. He proposes that modernity holds within itself the seeds of its own transformation: the process of individualisation (section 7.3.1); the redistribution of the production of wealth and risk (section 7.3.2), and the destandardisation of labour (section 7.3.3).

This significance of the Lending Advisor research project was made all the more important since it expanded an aspect of Beck’s thesis that had previously been neglected, the destandardisation of labour (section 7.4). Chapter Seven, therefore, aimed to contribute to this theme by presenting an analysis of Lending Advisor’s role in the transformation of the nature of its users’ work in UK Bank.

Further, although Beck ascribes information and communication technologies a key role in the transformation of industrial society, they have not been the primary focus of his research. The Lending Advisor case study data extended and updated our understanding of the impact of information systems, particularly on the social construction of risk and identity in the late industrial society (sections 7.5 to 7.6).
It did this primarily by considering the Lending Advisor project, and the radical programme of organizational change associated with it, in the context of the destandardisation of labour (section 7.3.3). Beck (1992) uses this term to describe the way in which information technologies and new forms of organizational rationalisation are dissolving the standard industrial society concepts of ‘firm’, ‘job’, ‘career’ and ‘wage labour’. He suggests that information technologies enable a transformation in spatial and temporal assumptions about work in which many work processes become independent of geography, and contractual relations are more flexible.

The case study documented anxiety among LA users which could be related to the increasing perception of risk in society associated with the destandardisation of labour, for example: redundancies; structural re-organization; technophobia; major changes in work practices; new terms of contractual employment, including performance measures. These were brought about by a programme of organizational change which was uniquely enabled by Lending Advisor. It was proposed that these kinds of radical changes represented what Beck has referred to as second rationalisation.

For Beck, an expression of the ‘first’ rationalisation was Frederick Taylor’s philosophy of scientific management. The second rationalisation is different in that it is a reflexive rationalisation, in which seemingly ultra-stable organizational boundaries within and between division, sectors and so on, become malleable. As a consequence, we are presented with choices about the kind of future that we want to shape, for example opportunities to change company policy regarding the governance of the workplace and its dynamic with the community in which it is situated.

In the case of Lending Advisor, UK Bank credit policy underwent radical changes to reflect a new approach to portfolio management which focused on the ‘safer’ parts of the market; small businesses at the riskier end of the credit spectrum were placed on immediate ‘exit policy’ as criteria for creditworthiness shifted to the more quantitative LA measures. The title of ‘local branch manager’ was abolished and newly named ‘corporate managers’ were brought together in cluster teams whereby each manager
categories have stagnated and do not focus on the dynamic shifts that are taking place in society in agency, identity and dependency.

It became apparent in the interviews with LA users/managers that they were re-inventing themselves by revising their life narrative and, more importantly, that this was a crucial aspect of their adaptive process in this turbulent context. For example, in the first round of interviews technophobia was significant and many managers confessed that they did not know if they would survive the introduction of LA. However, in the second round of interviews, some managers had begun to find personal events and processes that served as 'glue' to bridge their former life with their present work practices and would cite them as evidence of continuity. For example: a typing course that they took as a boy; a son or daughter who they had raised to be successful in a computer-based career; events from the past that showed how they had always risen to a challenge in their life.

Issues like typing and the lack of lap tops might have been regarded as irrelevant 'whining' by researchers taking a more traditional research approach. However, by taking seriously the totality of the managers’ hermeneutic, cultural experience during the introduction of Lending Advisor, these emotional 'pressure points' highlighted a dimension of the risk society that had been neglected by Beck and which has considerable significance for the management and use of decision support systems like Lending Advisor.

Management have to recognise that context can have a profound influence on decision-making and, therefore, the impact of introducing a DSS is better understood through the concept of situated decision-making. This is particularly important with regard to the strategic positioning of human agents to DSS and introduction of performance-related contracts which can generate a growing sense of attrition among middle managers.
Table 8.3 Key points on IS in the risk society

8.2.4 Competing definitions and concepts of middle management

Middle management in both the public and private sector have tended to be overlooked by researchers (section 7.6). Mintzberg (1994) suggests that their role is not well understood and their work has ‘generally been treated either in isolation or as part of a mere list of roles’. The Lending Advisor case study provided, for the consultable record, valuable longitudinal field data focusing on the introduction of a computer-based decision support system into middle management decision-making in a UK retail bank.

In section 8.2.3 it was noted that traditional approaches to decision support systems treated them as if they existed in a vacuum, and therefore this dissertation attempted to offer an alternative perspective based upon the notion of situated decision-making. It was proposed that middle management have been subject to a similarly rational conceptualisation. If one wants to understand how decision support systems affect middle management decision-making, it is important to adopt a more holistic and hermeneutically-informed approach. The dissertation therefore took the concept of situated decision-making and considered its implications for the loans managers in the LA case.

It was suggested that the process of reflexive modernisation, with its consequences of destandardising labour and generalisation of risk, had considerable influence on the
loan managers' process of situated risk assessment (section 7.7). The case study documents a traditional occupation in transition and, it was suggested, the depressed state of the labour market had a considerable influence on the acceptance of Lending Advisor and its consequences (sections 4.6; 4.8; 6.2 and 7.7). Trade unions seemed helpless to prevent fundamental changes happening to standard work arrangements.

Hallier and James (1997) note that the employment relationship is currently beset by tensions, in particular, the disillusionment and anger of middle managers affected by the demise of their job security, career opportunities and the equity of their treatment (section 7.6). Their research indicates that the willingness and ability of middle management to subvert organizational strategy and day-to-day policies increases if they perceive themselves to be in a climate of personal and/or professional insecurity and sense their own future at risk. This adds emphasis to the concern that the LA loans managers may make compromises with regard to their portfolio, rather than assume risks that might jeopardise their performance criteria and the remuneration associated with it.

It was proposed that the introduction of Lending Advisor altered the terms and scope of 'risk' interpreted by the UK Bank loans managers (section 7.7). In the traditional, paper-based risk assessment process the managers would have to use their expert judgement to discern whether a loan was likely to default or not. The confirmation of this decision would not be apparent for a period of time. If the loan did default, this loss was justified in terms of an unfortunate turn in the market, crime or fraud, an 'act of God', or lack of judgement by the loans manager. Whatever the conclusion, the reason for the loss was within the local ecology of the loan.

After the introduction of Lending Advisor into the loans process, it was suggested, the traditionally risk averse loans manager faced new dimensions of disincentive. As noted in the case study, managers laboured long hours loading cases, a process that was taking far in excess of the estimates provided during LA training and early implementation (section 5.6.1). Increasing work loads and more restrictive criteria for lending mean that unconventional and/or high risk loans represent a considerable investment of time, one which managers may just choose to avoid.
Further, if a manager loads a case, and finds that Lending Advisor differs in its risk assessment, the manager now has to assume the additional risk of contradicting LA. He/she not only has to assess all of the traditional influences, but also has to consider the interpretation of Lending Advisor. Whereas, in the traditional manual process, the manager could attempt to explain or justify it when a loan later defaulted, s/he now has to take full responsibility for the failure, since Lending Advisor forewarned him/her of this likelihood at the time that the loan was made.

The introduction of Lending Advisor was accompanied by changes in the terms of managers' contracts which made them even more performance-related. This means that a significant proportion of the entrepreneurial risk involved in making a loan that does not conform to Lending Advisor's parameters, has been shifted from the corporation onto the loans manager.

A further consequence of the introduction of Lending Advisor was that the results of the decisions made by managers are no longer bounded by time and space (section 7.7). Local decisions now influence the lending behaviour of managers nationally and inform bank lending policy. It was suggested that this could change the pattern of investment in the UK and systematically deny capital to certain sections of industry, for example small businesses, film, and research and development companies.

The rational nature of the Lending Advisor computer-based decision support system itself further adds to, and exacerbates, new and unforeseen dimensions of the risk assessment process. UK Bank may face the problem of 'positive feedback', whereby 'multiple feedback from a system's own outputs continuously modify, and amplify, elements, processes or sub-systems within itself...[and] carry the actual state away from some 'reference state' that was chosen to identify the system' (Angell and Smithson 1991).

It was emphasised that there was no inevitable outcome to the Lending Advisor project, UK Bank had, and continues to have, choices regarding how to implement, manage and use LA. The competing definitions and conceptualisations of the Lending Advisor project were discussed in detail in the dissertation (sections 5.6 and 6.5). The original LA 'vision' was formulated by middle management and its aims
were to support and enhance the role of middle management. In contrast, top management seized upon the implementation of Lending Advisor to introduce radical rationalisation. Pinsonneault and Kraemer (1997) suggest that the impact of computer-based information systems on middle management will depend upon who controls the key structural arrangements and whose interests are being served by the computer. It was apparent at the time of writing in early 1998, that top management’s romance with rationalism is currently dominating.

It was suggested that there is considerable danger in placing undue faith in idealised scientific-rational models of risk which are based on historic data, particularly if that data may have been input in a climate of attrition as detailed above. To refer to the quote at the beginning of this dissertation: ‘Life is not an illogicality; yet it is a trap for logicians. It looks just a little more mathematical and regular than it is; its exactitude is obvious, but its inexactitude is hidden; its wildness lies in wait’ (Chesterton in Bernstein 1996). Financial institutions like UK Bank should not be seduced by the cost containment potential of DSS and its capacity to impose central control over lending. UK Bank needs to consider carefully both the kind of market that they are targeting and products that LA enables, then ensure that they sustain a critical level of human expertise to attain these goals and the long term ‘health’ of their portfolio.

Lending Advisor may render UK Bank dependent upon an increasingly rarefied specialist scientific-technical expertise. If a layer of middle management is de-skilled (6.3.3), UK Bank will be ever dependent upon a small number of specialist skilled analysts higher up the hierarchy to set the parameters of the Lending Advisor information system in order to ensure that it is responsive to its environment and that the feedback is of high quality.

UK Bank may find themselves in a situation where, as Beck suggests, the consequences of expert attempts to minimise risk (through the use of Lending Advisor) can only be managed by further development of specialist technical expertise. It was suggested that this transformation in the nature of risk assessment could prove to have high consequences not just for the local ecology of UK Bank, but also for the way in which the national and international economies are shaped.
One of the key concerns of this study was the way in which the introduction of the Lending Advisor decision support system highlighted the re-ordering of forms of expert knowledge within an institution (sections 7.4.1, 7.6 and 8.2.3) and the way in which this might affect decision-making supported by LA. Although Beck's (1992) risk society thesis highlights some aspects of the destandardisation of labour it misses this crucial epistemological tension currently being expressed in the modernisation of labour relations. As suggested above (8.2.3), this tension may have profound implications for the quality of decision-making within UK Bank.

At the root of this tension in UK Bank are competing definitions and concepts of middle management (section 7.6). The way that we define a concept reflects a process of epistemological 'ordering' with a corresponding network of power interests. It was proposed that the rational-cognitive conceptualisation of middle management is used as a legitimising device for radical reorganization by top management interest groups. If middle management are conceptualised as informational, routine, repetitive and existing within a social vacuum, they will be susceptible to replacement by computers. The modern myth of the computer is one conduit through which scientific-rational expertise has come to be seen as more valid than specialised, local lay expertise.

Tension between scientific-rational and lay public expertise is a major theme in the risk society. However, it is suggested that Beck's original thesis does not adequately address the reflexive nature of lay expertise. Beck maintains that, in the risk society, one of the consequences of public debate between experts is that the lay public have to choose who to trust and, in so doing, what risks they make themselves vulnerable to (for example, eating UK beef, or jeopardising their performance related bonus at work). Following Wynne (1996), it was suggested that Beck's concept of the lay public perpetuates the 'cultural dupe' model.

As Wynne (1996) suggests, the distrust of scientific-rational expertise is not unique to this stage of history, whether you call it high modernity (Giddens 1991, 1994) or risk society (Beck 1992). Beck underestimates the lay public's continuous capacity, in situations of dependence, to exhibit 'as-if trust'. In other words, as highlighted by
Wynne’s (1996) study of the Cumbrian sheep farmers (section 2.3.8), when the lay public perceive themselves to be dependent upon scientific-rational expertise they will act ‘as if’ they trust them, whilst privately remaining deeply sceptical. This helped us to understand why, in interviews, the concerns of the loans managers in the LA case were often bracketed by opening and closing statements which were, in contrast, pro-LA.

Further, it was suggested that the concept of risk in Beck’s (1992) thesis was too realist in nature. Beck adopts a rational-calculative approach to risk in which we choose who to trust and how to act. It was proposed that this is not how everyday people respond and reflect upon risk in their lives. Rational choice is only part of their process. Human agents attune themselves to their everyday social context, a process that involves some rational-calculative choice, but which also has an important hermeneutic, cultural dimension.

Although LA users/managers may make a conscious choice to use or not use the LA system, their response will also be shaped by the totality of their hermeneutic process and how they perceive themselves in their local cultural context. Thus the emphasis in this thesis on situated interpretation of risk, for example: the ‘survival’ rhetoric used during LA implementation; changes in contractual arrangements; the impact of the changing status of work as a source of identity, the shifting dynamic of dependency and agency associated with it; the anxiety generated by the epistemological tension surround LA in UK Bank; and its everyday supervision and management.

Recognition of the situated, hermeneutic response of middle management helped understand the potential consequences of introducing technology like Lending Advisor into organisations. It presented an alternative concept of middle management which emphasised their role as interpreter and negotiator within local communities and therefore highlighted a hermeneutic dimension of the risk society that had been overlooked. Beck’s virtual neglect of the hermeneutic sources of the late modern self implies a neglect of this crucial dimension of everyday life. Unless these hermeneutic and cultural sources are acknowledged, alternative forms of collective knowledge (Wynne 1996) and of organizing human agency may be systematically suppressed.
It was suggested that the risk society is not just about high modernity, but also about low modernity (Wynne 1996). Our focus should not, therefore, be confined to reflexive institutions but extended to embrace reflexive community (Wynne 1996) and the consequences of its marginalisation and suppression in the current definitions and management of risk.

**Key points**

- The dissertation contributes an in-depth longitudinal case study for the consultable record which augments literature concerned with middle management.
- The implications of situated decision-making for the LA case are considered
- The impact of introducing a computer-based information system into middle management decision-making processes in a UK retail bank is analysed
- A re-conceptualisation of middle management is proposed which challenges Beck’s conceptualisation of lay public expertise and his rational-calculative approach to risk
- Beck’s original risk society thesis is extended by emphasising the importance of the hermeneutic dimension in understanding the way that we reflect upon and respond to risk in our personal ‘ecology’.

**Table 8.4 Key points on middle management**

### 8.3 Implications of the hermeneutically-informed interpretive methodology

The hermeneutically-informed interpretive methodology adopted in this research study enabled a unique analysis, supported by empirical evidence from the Lending Advisor project, which contributed to areas of IS theory and practice. It was the contention of this dissertation that the traditional research approach adopted in much of the IS literature does not provide us with an adequate way of making sense of the opportunities and risks presented to us by information and communication technologies in the late twentieth century.

The intense changes taking place in late modernity are fuelling the emergence of an increasingly global society in which traditional institutions are being transformed.
The link between local actions and global consequences means that we should no longer sustain theoretical approaches which allow us to conceptualise events, processes or artefacts as if in a vacuum. Further this reflexive relationship has made malleable the boundaries between traditional institutions and their cultural context. It was, therefore, suggested that organizations neglect the hermeneutic, cultural dimension of society at their peril.

From this perspective, the traditional, rational concept of organizational strategy is unsustainable. The dominant approach to decision support systems in which decision-making and the way that DSS affects decision-making is analysed as if in a vacuum, does not adequately inform practice. The cumulative impact of these dominant views, propagated through a conformist management education system, upon the concept of middle management has been a corrosive one.

It may help the reader if a brief explanation is provided regarding the way in which the chosen methodology focused and enabled the analysis (section 3.7.2). The hermeneutically-informed, interpretive approach adopted in the research inspired a novel view of the Lending Advisor project which supported a distinctive analysis of the introduction of Lending Advisor. At its most basic, this meant that rather than scoping out conflicting interpretations of the strategic role of Lending Advisor, or attempting to triangulate, the researcher made careful note of each interpretation.

The notion that actors revise their interpretation of events or processes based upon past experience, present understanding and projection into the future helped the researcher make sense of the way in which the project was being re-interpreted or ‘translated’ over time by stakeholders in the LA project during the interview process. A growing awareness of the ‘multiple interpretations’ of Lending Advisor’s strategic role within UK Bank encouraged the researcher to construct an analysis that made sense of this transformation. Instead of searching for one ‘correct’ interpretation, the hermeneutic approach supported further investigation of these contradictions and prompted the researcher to ask the following kinds of questions: when there are competing definitions and ways of conceptualising a project, which one is manifested? At what points could the project team influence this outcome? How can we make sense of the way in which the role of Lending Advisor shifted over time?
Finally, the interpretive versus positivist debate, discussed in the methodology section (section 3.2), prompted an initial foray into the area of epistemology in order to understand the emergence of alternative ways of conducting IS research. It was suggested that interpretivist researchers need to be explicit about the theoretical underpinnings of their work (section 3.3). The reasons for this was that there is considerable scope in the practical application of the philosophical assumptions underlying it, which may shape the nature of the findings that arise from research. It influences the focus of the research, the attention given to certain processes or events at the expense of others, and ultimately the way in which that research informs theory and practice; the reality that it shapes.

This was taken further as a consequence of the review in Chapter Two focusing on the way that the concept of risk was being defined in different discourses (section 2.3.6). The way a concept is defined impacts not only the way it informs and manifests in practice, but also reflects a network of interests sustaining that definition. This became a key theme in the thesis; it inspired the development and extension of the concept of strategy formulation in practice (Chapter Five); it inspired the re-conceptualisation of DSS as a ‘prosthetic eye’ (section 6.4.3); and the subsequent consideration of both of these phenomena in the context of an extended, hermeneutically-informed risk society (Chapter Seven).

Interpretive research which depends heavily upon fieldwork data is frequently challenged by its critics on the basis that it does not display analytical rigour (section 3.7.1). Whereas quantitative research can point to statistical data and methods, qualitative researchers often shy away from this kind of methodological transparency. It was proposed that this is, in part, due to the influences of the researchers own background, collaborative relationships and the norms of academic institutions.

Some researchers carry around ‘methodological baggage’ from earlier education programmes, which means that although they ostensibly engage in interpretive research they are don’t feel able to recognise the full implications of its epistemological claim. For various reasons, they may feel obliged to tilt their
language and findings towards the modern scientific-rational tradition. This compromise means that the reader is denied an understanding of the analysis process.

Researchers may have 'sanitised' their work in deference to the norms of the academic institutions upon which they are dependent, or perhaps conformed to the disciplining effect of the academic publication process (Walsham 1995). There may also be aspects of their dynamic with collaborators or actors at the field site which they do not feel they can expose. However, these dynamics do wield an influence on the nature of the field data and its subsequent analysis. To this end, the methodology chapter included a 'confessional tale' which detailed some of these dynamics. Particular attention was given to the researcher's family connections with UK Bank (section 3.4) and the influence of her PhD supervisor in fieldwork interviews (section 3.6). The aim was to include a sense of 'lived experience' (Gadamer 1975), rather than a wholly sanitised version of methodology, and to acknowledge the situated nature of research.

### Key points

- The hermeneutically-informed interpretive approach enabled a unique analysis of the Lending Advisor case.
- The dissertation contributes an in-depth reflection upon the analysis process in interpretive research
- It considers the influences upon fieldwork of the researcher's own background, collaborative relationships and the norms of academic institutions.

#### Table 8.5 Key points on methodology

### 8.4 Further research

As mentioned in Chapter Two (section 2.2.6), authors like Glassman (1997) have suggested that the implementation of information systems like LA means that credit risk has been 'dealt with'. One of the aims of this dissertation was to keep the controversies associated with technologies like Lending Advisor alive, and recognise the essentially political nature of risk assessment (Perrow 1984).
There is much more research to be undertaken in this area. Davidson (1997) suggests that quantitative techniques for assessing and managing risk have now become established in market and credit risk within UK financial services. Further, he proposes that they are likely to be extended to other areas where, just as in the Lending Advisor case, we will see debate over whether or not you can quantify certain kinds of risks, like strategic risk, operational risk and reputation risk.

Future research could focus on the spread of quantitative techniques in financial services, and particularly on the politics of knowledge which were highlighted by the Lending Advisor study. Further, these risk management techniques may generate 'new' risks: for example regulatory risk; reputation risk; and/or interrelated risk (Glassman 1997). The emergence of these complications could be identified by further longitudinal field work.

Beck (1992) suggests we are living in an age of 'side effects' and a concern emphasised in this thesis is that the side effects associated with LA will not be confined to the local organizational setting. Although it may be too soon yet to tell, the social consequences of using computer-based decision support systems like Lending Advisor as an obligatory passage point for those seeking credit may prove significant. A further study could be undertaken to assess whether the use of technologies like LA is leading to systematic under-investment in small businesses (Kolari et al 1997) or unconventional ventures (for example film) since this could have a considerable impact on the UK economy.

The CEO of UK Bank said during a public lecture at The London School of Economics in December 1997, that: 'It does not fall to every corporation to do good in every generation'. Although this dissertation highlighted issues relating to the theme of responsibility (section 2.2.6 and 6.4.3), corporate governance was not its main focus. The systematic irresponsibility of corporations and governments has, however, been a major theme in Beck's work since his original risk society (1992) thesis and, it is suggested, that this could inform further research in this area. There is no question that organizations need to be responsive to the changes in their ecology, but does this relieve them of all responsibility for the world that their local actions
shape? This is a particularly interesting question to ask of UK retail banks, like UK Bank, whose share price has steadily climbed since the introduction of Lending Advisor.

As has been discussed, the hermeneutically-informed interpretive approach enabled a novel analysis of the Lending Advisor case. However, during the course of the research it became apparent that hermeneutics did not support an analysis of dynamic power relations. Although this was not a major surprise, bearing in mind Habermas’ critique of Gadamer, it could be argued that it restricted the analysis of the case study.

The evidence from the Lending Advisor case highlighted the way in which networks of interests were gathered around certain definitions and concepts, but this had to remain a minor theme in the analysis, which focused instead on the much neglected hermeneutic dimension. It also meant that when the managers told their ‘battle stories’ it was difficult to effectively analyse the power dimension implicit in them, except through the notion of ethics in Zuboff (1988, 1996) and Beck’s (1992, 1994) work.

A growing awareness of the limited concept of power in the application of hermeneutics led to an exploration of Donna Harraway’s (1991) work which introduced provocative images of networks and power. Harraway’s work helped make sense of the power dimension and enabled a novel interpretation of DSS as ‘prosthetic eye’. It is hoped that Harraway’s work will be explored further in future research.

The researcher was also conscious that she could have explored the notion of narrative further during the Lending Advisor research study. Had the researcher known at the beginning of the fieldwork that she may be witnessing the reconstruction of identity, closer attention could have been paid to this in the collection of field data. However, despite Gadamer’s emphasis on the role of language in constructing reality, this topic was not engaged early enough to achieve this. It is a phenomenon which the researcher has been sensitised to and will look out for in her next research study on the shift from traditional outcry to computer-mediated work processes at the London International Financial Futures Exchange (LIFFE) from 1998.
to 2000. The aim will be to extend Giddens' (1991) 'project of the self' through a study of 'survival narratives'.

This dissertation represents a maiden voyage, an in-depth report on the findings of a four year research project, the first piece of extensive research undertaken by the author. It raised many issues, themes and concepts which, based on evidence from the field work, the author attempted to analyse for the first time. It is regarded as a first step in terms of the analysis process, which opens up a distinctive landscape for research and makes some valuable contributions to the field of IS.
References


Boland, R. J., T. V. Ramkrishnan, and D. Te'eni (1994). “Designing information technology to support distributed cognition.”.


Orton, I. (1994). *Banks in All But Name: How non-banks are increasing their global market presence.* Dublin, Lafferty.


Newspapers and magazines

