TECHNOLOGICAL CHANGE AND THE PRODUCTIVITY PARADOX: THE MANAGEMENT OF NEW TECHNOLOGIES IN UK RETAIL BANKS

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ABSTRACT

Successful implementation of new technologies is necessary for survival in today's increasingly competitive banking environment. The banking sector is now the UK's largest investor in new technology. As a result of de-regulation and new technological opportunities, the dominant market position of the traditional banks is under threat from new market entrants. Such organisations are harnessing the latest technology to develop their services, and are not constrained by the costs of running national branch networks and integrating a diverse historical legacy of incompatible computer systems.

This thesis addresses the question of why the massive investment by UK retail banks in information technology is not being translated into significant productivity gains. The issue is referred to in the literature as the IT productivity paradox. It will be argued that the importance of the banks to the economy as a whole, and the position of the industry as the UK's largest investor in new technology, make it a particularly suitable arena in which to study this phenomenon.

Six empirical case studies of recent new technology projects are analysed by the development of grounded theory. The findings indicate that dysfunctional organisational structures and cultures, together with poor management of expertise, combine to sabotage change and constrain the potential of new technology projects. Most significantly, a lack of organisational learning is contributing to the IT productivity

paradox. Even successful projects had limited impact because the lessons learned were not disseminated throughout the organisation. The study concludes that the full potential offered by information technology will continue to elude the banks until their apparently complacent attitude towards organisational change is addressed.

CHAPTER 1 - INTRODUCTION

This introductory chapter begins by describing the thesis of the research, and then goes on to provide a brief overview of the major issues which will be covered in more detail later on. This includes a review of the historical and contemporary background of the banking industry, to explain why it was chosen as the subject of this study. These issues are expanded upon further in Chapter 3. An outline of the theoretical framework from which the thesis was derived is then described. A number of possible explanations of the IT productivity paradox have been put forward by earlier writers, and these theories are detailed in Chapter 2. Finally, the reasons why the particular research method pursued was chosen as the most appropriate for this study are explained. Full details of the methodological arguments are described in Chapter 4.

THE THESIS

This research investigates why the massive investment by UK retail banks in information technology (IT) is not being translated into significant productivity gains, given that successful implementation of new technologies is necessary for survival in the increasingly competitive environment that the banks inhabit. The literature provides examples from research in many industries of this so-called 'IT productivity paradox'. It will be argued that the importance of the banks to the economy as a whole, and the position of the industry as the UK's leading investor in new technologies, make it a particularly suitable arena in which to study this phenomenon. The pivotal position occupied by the banks in society also means that lessons learned from the cases studied may have relevance in a wider context than is usually provided by concentration upon one specific industry.

The research undertaken will show that various aspects of organisational structure, culture and management style (such as a tendency to adhere to traditional processes and values) can combine to sabotage change, thereby constraining the potential of new technologies in the major UK banks. The specific nature of the factors inhibiting new IT project success in the banks studied, and the relationship between each of these factors, was not apparent at the beginning of the programme, but became clearer as the research progressed. Analysis of the empirical material collected suggests that a lack of organisational learning is contributing to the maintenance of the IT productivity paradox. Until this issue is resolved, it is contended in this study that even IT project successes will have a limited impact upon the activities of the organisation as a whole. This is because structural and managerial constraints ensure there is little chance of the lessons learned from successful projects being adopted in other parts of the organisation. As a result, specific successes are rarely replicated elsewhere.

BACKGROUND TO THE STUDY

The financial services industry is an important area for study as it plays a major role in the changing fortunes of the UK economy. It is also the largest investor in new technology within a society that is rapidly becoming dominated by service industries. The banks regard technological investment as the key to generating competitive advantage and maintaining their threatened domination of the market for financial services. According to a 1996 survey by Computer Weekly and Kew Associates quoted in the Times, the UK banking and finance sector as a whole was expected to spend £5.28 billion on information technology in that year alone. The figure represents an increase of 13 percent over total spending in 1995. Figure 1

summarises the overall current and forecast expenditure on information technology by European banks. More recently, an information technology survey by the Financial Times (1st July 1998) estimated that total expenditure on IT systems by European banks was likely to exceed $21 billion in 1999 alone.

Progressive deregulation in the financial services industry, and the availability of new technological opportunities, has meant that many traditional barriers to market entry have now been removed after the banks have enjoyed years of operating as an informal cartel. It has also resulted in greatly increased levels of competition in the industry. For example, Microsoft could use its domination of world-wide computer networks to introduce new forms of money transmission, and telephone operations such as First Direct, unlike the major market players, are not tied by the costs of maintaining outdated (but still essential) computer systems and extensive branch networks. Tesco and Sainsbury are among the major retailers now offering banking services. Both have an extensive customer base and strong brand image. They also offer their customers higher rates of interest than any traditional bank or building society.

In response to these ongoing changes, the banking industry is undergoing significant structural adjustment. Recent merger and acquisition activity includes Lloyds of TSB and Cheltenham & Gloucester building society, Hong Kong and Shanghai Banking Corporation of Midland, and the merger of Halifax and Leeds building societies, to name but a few. Many building societies are also opting to lose their 'mutual' status, effectively turning themselves into banks and thereby allowing the provision of a full range of financial services.

STRUCTURE OF THE STUDY

Chapter 2 reviews the literature on the broad issue of technological change. The aim is to provide a theoretical framework within which the empirical study of new technology projects in the banks can be located. Additional literature which is specifically related to the issues raised in the empirical work is described in later chapters where relevant. Because of the inter-disciplinary nature of the study, it is not possible to review in full previous work in all of the related fields, and indication is given in the text where brief summaries of existing literature only are provided for the sake of clarity. For example, the issue of a 'banking culture' is frequently raised in the case study banks, but it is beyond the scope of this thesis to explore in detail the many facets of corporate culture.

Chapter 3 reviews the history of the financial services industry in the UK, and describes how IT has evolved into an integral part of the banking business. It then compares innovative developments by the established banks with the activities of industry newcomers, and speculates upon the potential impact that successful developers of new technological innovations may have on the traditional make up of the industry.

Chapter 4 describes the method which was followed in conducting the research, and also the principles of grounded theoretical analysis that were applied to the data collected from the case study banks.

Chapter 5 introduces these banks and their particular new technology projects which formed the empirical research material. The dominant categories to emerge from the analysis form the subjects of the remaining chapters, namely:

Chapter 6	-	Organisational Structure for IT
Chapter 7	-	Knowledge Management
Chapter 8	-	Leadership
Chapter 9	-	Organisational Culture

Chapter 10 describes the results of a further analysis of these chapters which highlights a lack of organisational learning in the banking industry. This finding was the common theme to emerge from the analysis process. The concluding chapter considers whether the specific research questions detailed at the end of Chapter 3 have been fully addressed, and identifies areas where further research is necessary. Finally, the implications of the findings are considered in the context of future success prospects for both the traditional banks and industry newcomers.

SUMMARY OF RELEVANT THEORETICAL DEBATES

Research by Freeman (1988) into the causes of Japanese success in recent years, accorded a primary role in the pursuit of economic growth to technological innovation, in both products and processes, which facilitated cost reductions and quality improvements. He showed how these changes were themselves based upon a combination of deeply rooted social and organisational characteristics. He also noted the increasing importance of service industries to the UK economy because of their massive investment in information technology to develop and enhance their

businesses. Freeman's work therefore seems to imply a major role for the banking industry in the process of technological change.

Barras (1990) described the financial sector as '*the vanguard of the service revolution*' and claimed that the diffusion of new technology from the banks to the rest of the service sector would eventually reap benefits for the whole world economy. Other writers have considered the implications of developments in information technology to be so pervasive that they will eventually facilitate a new wave of economic growth at a macro level, with attendant rewards for its protagonists (Bolter, 1989, Freeman and Perez, 1988, Zuboff, 1988.) These authors all maintained that established business practices were likely to be transformed during this process, and traditional structures and mechanisms rendered obsolete.

In practice, there appears to be little evidence so far that the banks are living up to their supposed role as leaders of a 'technological revolution'. A paper by Flannery (1996) reflects back on the forecasts he made in a 1973 book when the 'impact' of technology on banking business was being discussed in a similar language to today's talk of 'revolution' and 'transformation':

> *"In reviewing past predictions about the impact of technology upon financial services provision, I discovered that history has not been kind to many of our forecasts. I urge you to consider this fact when evaluating today's technology-induced 'transformations of the financial landscape.'"* (Page 965)

In 1973 Flannery had predicted the imminent demise of paper cheques, and the circuitous bank clearing network, in favour of an electronic system. While there have undoubtedly been important developments in electronic payment systems since his

original work was published, they have evolved alongside the paper based methods rather than replace them. For example, the credit card industry has grown dramatically since 1973 but settlement is still dependant on a voucher-based authorisation system. The cheque clearing system in the UK is now largely automated, but still operates to traditional timescales and mechanisms whereby paper is physically exchanged between branches. Caution is clearly necessary because parallels can be traced here with current extravagant predictions of the likely impact of 'home' or 'internet' banking upon the demand for more traditional systems.

Despite the scale of their IT investments, and the level of knowledge built up over some 30 years of computerisation, Gates (1995) has dismissed banks as '*dinosaurs*' in their use of IT. Technology companies have made handsome profits by encouraging banks to spend more and more money on technological innovation, but the benefits are often elusive. The computerisation of banks has been referred to in the Financial Times as *'the biggest bank robbery of all time'* (Naim, 1996). A recent survey by Morton, of IT consultancy Braxxon Technology (1996) found that 71 percent of the banks questioned had no idea whether their new technology systems delivered value for money, and 50 percent had no measures in place to assess the effectiveness of their investment.

While IT applications have undoubtedly increased processing capacity by automating tasks previously accomplished by hand, it will be shown in this thesis that the opportunity to utilise technology to instigate more fundamental change has not been maximised. New systems introduced in the banks often make little impact upon productivity and stimulate little change to established routines. This phenomenon has become known as the 'IT productivity paradox'. Hackett (1994) addressed the specific issue of low return upon the massive technological investment in service

industries. He claimed that 80% of all technology investments are now made by the service sector, but his work showed how productivity (defined as the value of outputs measured against the value of labour and capital inputs) in the banking and insurance industries has been in decline since 1977. It can, of course be argued that the banks have focused upon quality improvements rather than cost reductions, although evidence for this is hard to find.

Research by Fincham et al (1994) found that banks had concentrated their IT strategies upon the automation of existing processes to reduce costs, and also in copying the trends set by their major competitors, rather than focus upon innovation and business transformation. As a result, the traditional structures, functions and priorities within the banking industry still remained largely unchanged. Chapter 5 will describe how attempts by the banks to establish a European-wide payment system have so far been unsuccessful, with international money transmission remaining an area of banking which still relies upon procedures and timescales established in the Victorian era.

McLoughlin and Clark (1994) identified three major contributory factors to the IT productivity paradox. Firstly, they noted a tendency for new technologies to merely replicate existing procedures, rather than make use of the opportunity to update and integrate work processes. (This finding is supported by the work of Zuboff (1988). She distinguished between two possible uses of new technology; on the one hand merely to 'automate' tasks that were previously accomplished manually, and on the other to 'informate'. This meant using technology more imaginatively to add value to business transactions.) Secondly, McLoughlin and Clark found that the relationship between employee and machine resources was often badly managed. Thirdly, there

tended to be a poor fit at the organisational level between technology strategy and the overall objectives of the companies studied.

To summarise the arguments made so far, it is clear that despite the growing importance of service industries in the UK, and the opportunities presented to both traditional and new market entrants by technological advances, the banks have had limited success to date with the implementation of innovative projects. Historical evidence shows that exaggerated claims of the 'impact' of technology have been made in the past, and the passage of time has revealed a more prosaic outcome. In contrast to the predicted 'revolution' in business structure and practice precipitated by IT, in many respects little appears to have changed. This is despite the dominant market position enjoyed by the banks and the vast sums of money they have devoted to technological investment over an extended period of time. Such reticence also offers significant opportunity for new market entrants to challenge the traditional banking structure in the UK. This study will seek to establish the reasons for what can at best be described as a disappointing track record with new technology in the banks.

The reasons put forward by earlier writers for the disappointing findings outlined above are expanded upon in Chapter 2, but can be summarised here as follows:

- A lack of accountability, whereby money wasted is written off and lessons are not learnt from failed projects

- A focus upon the automation of existing procedures, which is symptomatic of a reluctance to change established business practices

- Poor human resource management, with 'technology' issues taking precedence over 'people' issues

- Misalignment of technology and business strategy

- Patching of obsolete technologies to meet changing demands

Examples can also be found of research that is more optimistic about the opportunities offered by IT. Freeman (1988) suggested that technological developments were pervasive enough to precipitate a new 'techno-economic paradigm', once enough time was allowed for the necessary (and major) social changes to catch up with technological developments. Zuboff (1988) described how IT had the potential to 'informate' business processes. By this she meant that significant qualitative improvements could be made, provided the systems were designed intelligently and with the input and cooperation of all the employees involved. Benefits would therefore accrue to the business over the longer term, but their intangible nature would make them difficult to measure in a quantifyable way.

So on a more positive note, the productivity paradox could also be explained as follows:

- Insufficient time has yet been allowed for organisational changes to be implemented, thereby matching rapid technological developments

- Organisations are using IT to facilitate the introduction of entirely new business practices, or to focus upon service quality improvements - features which are difficult to quantify in terms of productivity.

THE RESEARCH METHOD

In view of the importance of the banking industry to the UK economy as a whole, the apparent paradox between technological opportunity and business reality in the UK retail banks warrants further investigation and analysis which will be undertaken in this study of 6 major new technology projects. The various explanations for the IT productivity paradox that have been introduced here will be assessed in the context of experience of new technology implementation in the case study banks. The aim of the empirical research is thus to establish the extent to which grandiose claims for the 'impact of IT' in the banking industry are actually borne out in practice. The study will focus upon material obtained from a range of new technology projects recently implemented in both the traditional UK retail banks and by industry newcomers. In cases where projects can be categorised as failures, the reasons for the observed shortcomings will be explored. Equally, the factors underpinning the management of more successful projects will form a useful area of comparison and contrast.

The results of the empirical study will be analysed in conjunction with the findings of earlier researchers in the area of technological change management in banking. Particular attention will be paid to the relationship between organisational technology policies and the *nature and extent* of change that is introduced. Previous work in the banks (for example by Scarbrough and Lannon, 1994; Pennings and Harianto, 1992; Morris and Westbrook, 1996) has concentrated upon individual cases and specific results obtained rather than reviewing the range of possible solutions and analysing why in some cases one particular strategy was favoured over others - which is the approach taken in this thesis.

It is anticipated that the research process will identify other specific organisational and management issues that impact upon the change process in either a positive or negative manner. The recommendation of particular management strategies which enable the full potential of information technology projects to be unlocked, could be of practical value as a guide to aid the running of future projects in the financial services sector. In addition, the comparison between the technology management strategies of industry incumbents and new market entrants will inform the debate over the extent to which banks are likely to maintain their dominant market positions into the 21st Century.

CONCLUSION

By investigating the reasons why IT investments in the banks have failed to meet expectations, this study will address the issue of whether UK retail banks are equipped to sustain and build upon their traditional roles at a time of significant environmental change. This chapter has described a range of possible explanations for the IT productivity paradox which have been proposed by earlier writers. It will be argued in this thesis that despite massive investment in information technology over a long period of time, the major reason why banks are not obtaining maximum value from new projects is because of a lack of learning from past mistakes.

CHAPTER 2 - LITERATURE REVIEW: TECHNOLOGICAL CHANGE AND THE PRODUCTIVITY PARADOX

INTRODUCTION

This chapter reviews relevant literature on the subject of technological change and the IT productivity paradox, firstly at the macro and secondly at the micro level. The aim is to provide a conceptual and theoretical framework that will inform subsequent analysis of the actual influence of technology in specific organisations within the financial services industry sector. The chapter begins by considering the importance of innovation and technological change throughout the economy in the context of continued economic growth and prosperity. This somewhat utopian scenario is then compared with the reality of technological change in practice. The relative economic decline of the UK on the world stage in recent years is noted, and evidence put forward to show how productivity has actually declined despite the widespread adoption of information technology throughout the economy. It is beyond the scope of this study to investigate possible links between national economic decline and the effective utilisation of IT within organisations, but this discussion introduces the issue at the heart of the thesis - the apparent paradox of diminishing returns in the banking industry despite massive technological investment at the organisational level. Whilst cognisant of the dangers of generalising from specific case studies, it is contended here, (and developed further in Chapter 4) that detailed examination of individual projects can provide valuable insights into a problem which appears to be endemic at the macro level.

To inform the subsequent debate about the nature and extent of technological change espoused by the banks, the chapter goes on to examine the various definitions of 'technology' that have been put forward by writers in this field. A number of theories are then discussed which have been developed from these ideas as to the influence of technology in organisations, each one purporting to characterise and explain technological change. The analysis includes a review of published literature on 'technological determinism', which assigns a positive and prescriptive role to the actual technology itself in the search for economic growth. The merits of alternative viewpoints which claim that the nature of a new technology is shaped to varying degrees by prevailing organisational attitudes and practices are then considered. This review concludes with a discussion of technological change and how the process can be managed. The chapter ends by explaining the position that will be taken in this thesis towards the definition and influence of technology and productivity, and why this particular viewpoint and the chosen methodology were considered to be most appropriate in the context of the study of the IT productivity paradox.

THE NEED FOR INNOVATION AND TECHNOLOGICAL CHANGE IN THE ECONOMY

Technological change is regarded as a process that is fundamental to the continued prosperity and development of a modern economy, enabling competitive positions to be maintained and enhanced. The simplistic Victorian view of technology attributed the causes of economic growth directly to new technological developments, without analysis of the nature of the change process and the inter-relationships between the variables involved. Technology was therefore seen as exogenous to the economic

system. The enduring work of Kondratiev and Schumpeter showed that the process was in fact more complicated than this. Kondratiev (1935) described how innovations seemed to be concentrated upon the upturn section of continual economic cycles of boom and slump, with each cycle taking about 50 years to be completed. The so-called 'First Kondratiev' was associated with the industrial revolution and growth of the textiles, iron and coal industries. The next cycle saw the rise of the railways in the mid 19th century, followed by the combustion engine and electricity at the turn of the current century. Since these ideas were originally published it is possible to add the growth of the large corporation after the second world war as a 'Fourth Kondratiev', and current developments in the field of information technology may be regarded as the start of another cycle.

Each wave has a pervasive impact throughout the economy because of the rise of associated industries and need for entirely new forms of expertise and working practices. Initially this generates optimism, demand, investment and employment until the new system is integrated into the economy. Opportunities exist for new firms to service the needs of organisations that do not have the necessary expertise to develop the new technology themselves. Increasing competitive pressures then force more and more players from the market, unemployment increases, investment and demand fall and economic downturn begins. Schumpeter (1942) developed the work of Kondratiev by emphasising the central role played by technological innovation in the growth of capitalist societies. He wrote of *'gales of creative destruction'* in which innovative products and processes swept aside obsolete industries and set up entirely new contexts in a disruptive, but ultimately beneficial fashion. Schumpeter referred to these changes as *'long waves of economic activity'.* His work has been influential in the development of more recent theories of technological change at both the macro and micro level.

For example, Freeman and Perez (1988) viewed the diffusion of information technology through the economy as the latest example of this phenomenon (the 5th Kondratiev wave) and claimed it was indicative of the emergence of a new *'techno-economic paradigm.'* They believed that a sufficient concentration of IT innovations at a micro level would have a pervasive impact upon the operation of markets as a whole, and the activities of organisations within these markets, stimulating economic growth and competitive advantage. Within this scenario, a new paradigm could emerge by a process of selection from a number of feasible innovations. However, the authors qualified their claims with the assertion that change would take many decades to filter through the economy *'as a result of a process of learning, adaptation, incremental innovation and institutional change.'* They warned that during the transition period, the existing social framework, (which had evolved to suit very different circumstances) would come under severe strain, as social change is even slower to achieve than technological change. The authors also noted that the new economic system which eventually resulted might require deliberate technology policies, and considerable investment, to create the necessary new infrastructure. The new system would both appear and operate very differently from earlier 'paradigms'.

At a more micro-level, Nelson and Winter (1982) also drew upon the work of Schumpeter. They took issue with traditional economic theory which assumes conditions of knowledge and environmental constraints that are rarely experienced in practice. They used an analogy with evolutionary biology to explain their influential theory of the nature of technological change, whereby the uncertainty generated by threats from competitors and unstable environments forces organisations to change and develop in order to survive. The authors claimed that those firms that managed

the process successfully would enhance their market position and the remainder would go out of business altogether. The interaction of various strategies and techniques that are used to pursue this goal are far more complex and wide-ranging than the 'profit-maximising' scenario of firm activity envisaged by orthodox economic theory.

Nelson and Winter emphasised the role of technology and technological change in the context of survival of the firm. They described how organisations within a given industry moved along *'a natural technological trajectory'* which was influenced by historical activities and defined the conditions under which the firm operated. A competitive edge could be generated by an organisation which was able to move these parameters into new directions by utilising the knowledge and expertise of its employees, the reputation and flexibility of its business, or other innovative means. According to the authors, this activity resulted in incremental, or 'evolutionary' changes because the costs and attendant risks involved in radical change away from the existing trajectory were deemed to be too high. The theory could also help to explain why businesses tend to react conservatively in the face of technological developments that call for entirely new concepts of work organisation and practices. It has been empirically tested in the banking industry by Pennings and Harianto (1992), who examined the introduction of video banking. They found that the skills needed to manage existing business operations tended to inform the direction of prospective changes, with the focus upon improvement of deficient or inadequate methodologies rather than business transformation. In their words:

> *"New solutions are similar to or in the neighbourhood of current solutions. On the voyage to new territories we are attracted to what looks familiar to or consistent with what we already know." (p.30)*

This idea is closely related to Basalla's (1988) view of innovation as the recombination of existing knowledge. It will be developed in subsequent chapters and tested empirically in the context of technological change in the banking industry.

To summarise the argument presented so far, the implications of developments in information technology have been considered to be so pervasive that they could eventually facilitate a new wave of economic growth at a macro level, with attendant rewards for its protagonists. In the process, claim supporters, traditional and established business mechanisms are likely to be rendered obsolete. For example, Forester (1985) described how developments in technology have acquired a *'revolutionary' tag,* thereby representing the most significant change since the early days of the Industrial Revolution. This has led to the ambitious idea of the potential applications of technology *'unleashing a tidal wave of technological innovation'* and hence economic growth. Barras (1990) introduced a *'reverse product life cycle'* model of the innovation process in the financial services industry, and extended it to the macro level with the ambitious claim that advances in information technology would eventually stimulate the diffusion of this process throughout the economy. Porter and Miller (1985) suggested that the impact of technological change could alter the structure of an industry, and in so doing introduce new rules of competition. Many other writers can be mentioned who have put forward similar claims for the 'revolutionary' impact of technology. Nellis (1994) considered that the impact of technology on profitability, structure and activities would be a key driving force behind the transformation of the financial services industry if it was to meet the challenges of the 1990s.

A number of significant developments could be cited in support of the argument that technology is 'transforming' financial services, notably Direct Line's innovative telephone based insurance service, and the relentless growth of call centres inspired by First Direct's telephone banking operation. Graham (1997) presented evidence which suggests that these services are evolving alongside traditional banking business rather than replacing it, because bank customers are maintaining their existing accounts whilst opening additional accounts with telephone providers:

> *"New direct channels simply add another layer of costs, while older and more expensive ones have to be kept open. Although the leading high street banks have closed nearly a quarter of their branches over the past ten years, the branch is still not dead."* (p.3)

Brierley (1997) supported this finding with his analysis of recent research into brand awareness in the financial services industry. He concluded that while awareness of innovative banking products was high, actual consumer take up was significantly lower, and even then it tended to supplement a customer's existing arrangements rather than replace them. Dunne (1998) showed how First Direct has taken 8 years to record a small profit. This has been achieved during a period of very limited competition because other banks only belatedly recognised the potential of telephone banking. In comparison, she calculated that the 'Big Four' clearing banks together made £46.5 million per day in 1997, and that these profits had invariably come from 'bread and butter' business such as loans and mortgages:

> *"How have they done it? In their most basic form, banks make money because they lend to customers at one rate but pay a significantly lower rate to those customers who only want to deposit money with them."* (p.17)

So is information technology really transforming industry structures and business practices in the way that has been claimed? The next section of this chapter will contrast the somewhat utopian scenario of inter-linked technological innovation and economic growth described above with the apparent economic decline of the UK in the post-war period.

THE PARADOX OF RELATIVE UK ECONOMIC DECLINE IN THE TECHNOLOGICAL AGE: THE ROLE OF BANKS AND FINANCE

The relative decline of the UK as a world power has been neatly summarised by the title of a book by Hutton (1995) - *'The State We're In'.* The book begins by charting historical events that have contributed to the commonly perceived status of the UK - and which still prevail in the country to this day - as the leader of the industrial revolution, empire builder, workshop of the world, and winner of two world wars. Despite political rhetoric, the reality is far more prosaic and Hutton illustrates how the facts of economic decline have been well documented by many writers. According to a 1995 survey by the World Economic Forum, the UK now ranks towards the lower end of international prosperity league tables, just two places above Chile. In a similar survey by the OECD, Britain was placed 18th out of 24 countries. Paradoxically, this relative decline in recent times presents quite a contrast to the boom years of the 1950s and 60s, which pre-dated the widespread application of information technology.

Hutton also noted that in Victorian times the commercial banks increasingly focused their business upon trade activities with the expanding empire, rather than upon domestic industrial investment. Hutton identified the structure of the UK financial

system and its reluctance to support industry as the chief reason for the comparative failure of Britain to exploit technological developments such as chemicals, electricity and combustion engines in the late 19th Century. He cited examples of Brush and Crompton, large engineering firms that were unable to raise finance from the banks which would have allowed them to exploit the expanding electrical market, and also Mond and Brunner (later ICI), which was obliged to look to Belgium for funding.

The only exception to these policies occurred in the 1930s when deepening economic and political crises forced government intervention to encourage the banks to offer concrete support to domestic industry. Bank funding was reluctant, and lasting relationships with industry were not established, but the immediate results were impressive. Hutton validated his notion of the important links between the finance industry, industrial productivity and technological innovation by describing how output in the machine tool, chemical and aerospace industries also increased substantially during wartime, and how many innovations essential to the war effort were made, for example jet engines, radar and nuclear fission. After the war, the international power of the City was gradually restored, controls over the banks reduced, and the continuity of purpose which had briefly stimulated industrial momentum was again lost.

Other recent research has attempted to quantify the extent of economic decline, as well as provide explanations. Freeman (1989) measured the level and trend of UK expenditure on research and development during the 1980s in comparison with other OECD countries. The figures were taken to be indicative of the extent of innovation and technical change in each of the economies studied. To compensate for any weakness in the perceived correlation between financial expenditure and the extent of change espoused, he excluded military research and covered a period of many

years to adjust for cyclical fluctuations. The results of this research showed that the growth rate of UK industrial research was the lowest in Europe (with the exception of Switzerland) since 1967, and that its 'R and D intensity' had steadily declined relative to competitors with a similar industrial structure. Freeman blamed industrial decline upon the withdrawal of state intervention and funding, lack of co-operation between universities and industry, a short term outlook by industry leaders with a focus upon profitability rather than investment for the future, and poor quality education and training. He summarised his research as follows:

> *"It is difficult to escape the conclusion that this represents a serious weakening of the long-term competitiveness of the UK economy" (p.206)*

These findings are supported by the work of many other writers. Beuret (1987) quoted the reduction in the UK's share of world trade from 39% in 1900 to 8% today as evidence for relative economic decline. He also observed the willingness of the UK government to allow foreign industrial investment in direct competition with British firms (Nissan), to sell off British car manufacturers to foreign firms (Leyland, Rover) and to purchase Boeing's airborne radar system rather than GEC's. Hayes and Abernathy (1980) in an influential article criticised the *'devotion to short-term returns'* by which they believed managers had *'effectively foresworn long-term technological superiority as a competitive weapon.'* Analysis of British industrial performance by Porter (1990) noted a loss of market share in most of the country's sophisticated industries:

> *"...large net losses in machinery and in industries serving other industries (transport, office equipment, telecommunications, and power distribution)*

> *signal an inability to upgrade, a shrinkage of clusters and a narrowing of competitive industries in the economy."*

From this evidence it can be seen that, relative to its competitors, economic performance in the UK has been in decline for a significant period. It is tempting to extrapolate from this macro perspective to the micro-perspective and conclude that IT project failures in the banks may be symptomatic of a 'British disease.' Certainly parallels may be traced between the 'hands off' policies adopted by the banks as a whole towards industrial funding as described above, and their own internal practices which demonstrate an apparently similar reluctance to embrace the potential of IT at the micro level. For example, later chapters will show that many banks still retain rigid demarcations between IT and business areas, which tends to constrain the opportunities presented by new technology. However, a comparative analysis on an international basis is necessary to even begin to test this hypothesis, which is beyond the scope of the thesis. Therefore to draw such a conclusion would be speculative at best.

The next section of this chapter moves the discussion from the macro to the micro by focusing upon an area that can be more readily tested. It details the various explanations that have been put forward by earlier writers for the existence of an IT productivity paradox at the organisational level.

THE INFORMATION TECHNOLOGY PRODUCTIVITY PARADOX

So why are information technology investments failing to deliver value for organisations? Vast resources are being spent on new technology, often with disappointing results (see for example Roach 1991, Berndt and Malone 1995). The

scenario is well summarised by Coombs (1992) in his study of the impact of new technologies on organisational behaviour:

> *"Sometimes it seems that the technological potential increases, the claimed business advantages multiply, and the boxes get cheaper and cheaper: but the budget and the headcount still rise, the benefits seem elusive, and the strategic direction of the IT investment and development programmes becomes ever more of an organisational battleground." (p.1)*

Hackett (1994) highlighted the growing power of the service sector with his claim that 80% of all technology investments are now made by service industries. His work sought to ascertain why low returns were being made upon the massive technological investment in this industry sector. He showed how productivity (defined as the value of outputs measured against the value of labour and capital inputs) in the service sector as a whole had not improved, and had actually been in decline since 1977 in the banking and insurance industries. This surprising finding is supported by many writers in a variety of industries, notably Franke (1987), Freeman (1988), Smith (1989), Bowen (1989) and Forester (1995).

The question of exactly how productivity changes are measured is notoriously difficult to address, and can therefore cast doubt on the accuracy of many studies. Boddy and Buchanan (1984) argued that conventional approaches to productivity measurement provide only a limited guide to the overall effectiveness of new technology:

> *"Measurable aspects of performance may be emphasised at the expense of other equally important but less measurable factors, such as the quality of the end product."* (page 234)

The authors also noted how by focusing upon productivity improvements in one area, adverse impacts on the productivity of related areas could well pass unnoticed. This finding is supported by Senker (1985) who showed that traditional investment appraisal techniques were used by UK companies to justify their expenditure on new systems in terms of the labour savings that would result from such action to that particular area. Such a policy ignores the wider potential cost impacts of work re-organisation or the need for acquisition of new skills. Other writers have gone further by claiming that the figures upon which investment decisions are based may be at best inaccurate or even manipulated for political reasons in order to force through a favoured solution (see for example Wilkinson 1983).

Wilson (1995) tackled the issue of productivity measurement by comparing the results of 20 studies by researchers from a variety of backgrounds, who had assessed the effects of IT investment on organisational performance in a number of different industries. The studies encompassed the use of a broad range of research methodologies, and deployed various analytical techniques against which productivity changes were measured. This work therefore overcomes a frequent complaint that reliance upon one particular mode of productivity measurement threatens the validity of the findings (Berndt and Malone 1995). Wilson provided convincing evidence of the extent of the problem; her analysis showed that the majority of the studies (13 out of 20) had found no evidence of productivity gain as a result of the introduction of new technologies.

Quantitative studies of the information technology productivity paradox such as the ones described above have limited value in assessing why such a phenomenon should be observed when new technology is introduced. The next two sections attempt to draw out the reasons that earlier writers have identified for the poor results obtained. The findings can be categorised under six headings:

1. Lack of accountability

A report on IT in the banking industry by The Economist (1992) discovered few successful new technology implementations. Most banks expressed disappointment with their new systems, despite the high levels of investment. At the time of the study, 90% of bank payments still involved the use of paper - a figure that was predicted to fall only to 70-80% by the year 2000. Given the importance of the banking industry to the economy as a whole, and the extent of the investments they have made in new technology in an attempt to generate competitive advantage, it is not unreasonable to presume that the banks themselves would be concerned about the lack of value they have obtained. On the contrary, as described in Chapter 1, previous research has shown that few UK banks attempt to measure the effectiveness of their IT projects, and many have no idea whether their new systems deliver good value in terms of the money spent.

2. Focus upon automation within existing structures

Research by Fincham et al (1994) in the banking industry found that banks had concentrated their IT strategies upon the automation of existing processes to reduce costs, and also in copying the trends set by their major competitors, rather than focus upon innovation and business transformation. As a result, the traditional structures,

functions and priorities within the banking industry still remained largely unchanged. The authors concluded that technological change in banking was 'evolutionary' rather than 'revolutionary' in nature. For example, home banking using a computer link has been hailed as the delivery mechanism of the future since the early 1980s, but the banks have been slow to develop its potential. To date, home banking remains very much a niche market in the UK, affecting only 0.3% of retail customers (Graham 1997). In fairness to the banks, he noted how progress has also been restricted by external concerns such as security issues, and by a lack of computing skills still prevalent amongst older segments of the banks' customer base. As a further example, Chapter 5 will describe how attempts by the banks to establish a European-wide payment system have so far been unsuccessful. Despite technological developments, international money transmission is an area of banking which still relies upon procedures and timescales established in the Victorian era.

Hackett (1994) blamed declining productivity upon increased automation expenses due to a lack of integration between new technology and business operations. By focusing merely upon the automation of existing (but often outdated) procedures, organisations were missing opportunities for business redesign and the associated productivity improvements when IT is integrated with business strategy:

> *"Many operational units were never planned. Instead they evolved to fit the apparent needs of the business they support. Work tends to be executed in the same fashion as it was a decade ago, while the competitive environment has become much more complex." (p.24)*

Hackett goes on to explain that the tendency to replicate existing processes when introducing new systems reflects a general antipathy towards change and a

preference for the security of familiar and established routines. Similar findings were reported by Pennings and Harianto (1992), whose work was described earlier in this chapter.

3. Misalignment of technology and business strategy

Coombs (1992) blamed the tendency for organisations to focus upon rational, linear planning systems (for an example see Chandler 1962) when implementing new projects, thereby ignoring the inevitable political processes within companies, which he claimed would sabotage the most careful plans. He noted that these project planning models become increasingly limiting as IT projects become ever more strategic in scope, and must reconcile a number of different vested interests. To address the problem, he recommended the revision of organisational structures to allow closer working relationships between technical and business areas. McLoughlin and Clark (1994) also noted that the relationship between employee and machine resources was often badly managed, and additionally they observed a poor 'fit' at the organisational level between technology strategy and the overall objectives of the companies studied.

4. 'Patching' of obsolescent technology

A survey by Morton (1996) reported that banks tended to patch together inefficient systems to maintain existing business practices, and hence avoid the uncertainty associated with the learning curve of new system introduction. The author concluded:

> *"In the long term this will be a ball and chain, limiting the ability of the banks to run their business and constraining development of new services."*

Fincham et al (1994) also supported this finding in their study of the Scottish retail banking industry:

> *"The sector is handicapped by ageing and inflexible information systems. Often data is inefficiently structured for applications not anticipated when the databases were first designed, and their piecemeal uptake means that organisationally the data is seldom well integrated." (p.156)*

The common theme running through the research described above is either explicit or implicit criticism of the way in which new technology projects are managed, leading to disappointing results and squandered opportunities. This suggests that a purely economic viewpoint focusing upon the measurement of productivity changes sheds little light on the reasons why poor results are obtained. It will be argued in Chapter 4 that the qualitative methodology adopted in this thesis allows the management issues surrounding new technology implementation to be investigated in depth. By focusing upon detailed contemporary micro-level cases, study of the productivity paradox can be taken a step further than is permitted by a quantitative approach.

The various possible explanations described above for the IT productivity paradox can be summarised as follows:

- A lack of accountability, manifesting in a reluctance to assess project effectiveness and take action to address past mistakes

- A tendency to use the introduction of new technology to automate established organisational procedures, rather than to act as a catalyst for changing outdated routines

- A lack of consideration for the social and expertise issues arising from the implementation of new technology projects, reflected by an inability to integrate technology and business strategy so that the new systems introduced actually support organisational objectives rather than compromise them

- A tendency to patch together obsolete technologies to meet increasing demand so that resources are exhausted by 'firefighting' rather than directed at the development of more appropriate solutions

The next section of this chapter reviews literature that reflects a more optimistic viewpoint about the reasons for the existence of the IT productivity paradox.

1. Length of time necessary for change to occur

Earlier in this chapter, Freeman and Perez's theory of IT, as indicative of the emergence of a new 'techno-economic paradigm', was introduced to illustrate the importance of technological change to the continued prosperity of the economy. Freeman (1988) applied this idea at the organisational level by suggesting that insufficient time has yet been allowed for a new era based upon information and communication technology to emerge. He claimed that enhanced productivity can only result once companies have instigated the necessary social change to match new technological capacity. In other words, Freeman's explanation of the productivity

paradox centres on the difficulty experienced by organisations in changing the ways in which they do business to get the full benefit from new technologies. More time needs to be allowed in order to achieve "*a good match between the technology and the institutional framework.*" (p.19)

Freeman's theory is supported by Franke (1987), who noted that the transformations wrought by the Industrial Revolution were spread over some 200 years, and would not have appeared so radical at a specific instance during this period. It is only the comparative viewpoint offered by hindsight that makes the changes so apparent. On the same basis, he claimed that it would be the 21st Century before the necessary organisational changes could be implemented and fed through into increased productivity, resulting in business transformation on a similar scale to that experienced in the Industrial Revolution. Similarly, David (1990) compared the growth of information technology to the evolution of electricity, which was also allocated a 'revolutionary' label when first made available. It took several decades for people to learn how to make the most of the new technology and overcome their preference for traditional and familiar alternatives. The same argument has been used persuasively in Simon's (1987) study of the development of the steam engine. The common theme running through these studies is the need for an extended learning curve whenever a radical change to existing practices is required.

2. IT as a catalyst for transformation of business processes

Some writers have explained the existence of the IT productivity paradox in terms of the use of IT to facilitate a proliferation of new products and services rather than improve the productivity of more traditional business. Such a transformation in the activities of the companies concerned would necessitate considerable investment

and swallow up resources over a long period, thereby having a negative impact upon usual measures of productivity. In addition to the capacity of IT to automate certain tasks in pursuit of cost-cutting objectives, Zuboff (1988) noted its potential to 'informate' (or in other words generate synergy by intelligent application) so that the outcomes transcended expectations in terms of creating new business applications by connecting formally disparate activities. For this somewhat idealistic scenario to be generated, Zuboff emphasised the importance of bringing together human knowledge at all levels of the organisation to create new systems that are 'greater than the sum of the parts.' She described how the information provided by a new IT system has to be understood and managed so that value can be created from it. This thesis is supported by Berndt and Malone (1995) who contended that attention should be focused on radical new ways of organising work rather than upon measurement of incremental changes in traditional business practices:

> *"It is often the case in human affairs that focusing on simple quantitative measures can distract people from achieving the ultimate values these measures are intended to represent." (p. 181)*

This section has described the more optimistic explanations of the IT productivity paradox which can be summarised as follows:

- More time is needed for the significant organisational changes to be implemented which are necessary to exploit the full potential of new technologies

- IT is being used to facilitate the introduction of entirely new products and services, which are so radically different from their antecedents as to make productivity improvements difficult to measure

Later chapters of this study will address the IT productivity paradox issue within the context of the UK retail banking industry, by considering which of the various explanations described above resonate with the examples of the case study banks. The framework of analysis described in Chapters 6 - 9 has been derived from grounded theoretical analysis of the technological change projects studied in these banks. Full methodological details are discussed in Chapter 4. Before testing the issue of the value of new technology projects empirically, it is first necessary to conceptualise the problem by considering in more detail a range of theoretical positions that have been taken in respect of the nature of technology, the dangers of technological lock-in and the technological change process.

WHAT IS TECHNOLOGY?

The failure of writers to agree on what actually constitutes 'technology' has led to considerable dispute over the nature and influence of technology in practice. As the choice of definition made will impact upon how the actual influence of technology in organisations is studied, this section provides some brief examples illustrating the myriad of positions that have been taken by different authors. For example, early work by Child (1984) referred to technology merely as '*apparatus*' within an organisational setting. This viewpoint is very narrow and does not acknowledge the influence of social factors within the organisation upon the nature of new system development. Reeves, Turner and Woodward (1970) went a step further and also included the related work practices in their definition of technology as:

> *"...the collection of plant, machines, tools and recipes available at a given time for the execution of the production task and the rationale underlying their utilisation." (p.4)*

Winner's (1977) definition encompassed three different levels, the equipment itself, the knowledge necessary to operate it, and the organisational structure required in which to situate and control it. This broad viewpoint implied that he considered the final form of a technology to be dependant upon the influence of organisational factors throughout the development and implementation process, but the number of variables involved makes the definition rather too cumbersome to be of practical use. Misa (1994) was even more sweeping in his own definition:

> *"...a technology is far more than a piece of hardware. Properly understood, 'technology' is a short hand term for the elaborate sociotechnical networks that span society." (p.141)*

Clark et al. (1988) claimed that popular definitions of technology were inadequate because of a tendency to ignore the various levels at which technology can be defined, and also the importance of the technical capacity of the equipment itself. They attempted to synthesise a more succinct definition of technology which was based upon the concept of an 'engineering system', and developed during an in-depth empirical study of the telecommunications industry. The approach acknowledged an 'independent' influence of technology to some extent, but at the same time an important role in the eventual nature of technology developed was maintained for the particular organisational conditions that prevailed throughout the change process. The authors' contention that a new technology embodies a

combination of technical features and organisational factors was observed in the empirical examples studied, and hence will be investigated and developed throughout this study. Consequently, the next section of this chapter considers the technical aspects of technological change and then goes on to discuss the organisational influences.

'TECHNOLOGICAL LOCK-IN'

Abernathy and Utterback (1978) devised a model of innovation based on the changing emphasis of technological development as a major new product innovation becomes established in the marketplace. They showed how the focus of development shifts over time, firstly to process innovation and finally to minor product improvements. They noted that as the technology matures and advantage can be taken of economies of scale to improve efficiency, the system as a whole becomes less flexible and increasingly centred upon the *'dominant design'* rather than further innovative activity. Also, by this stage the level of investment in financial and human skills is likely to be considerable. In such circumstances, the degree of cultural adaptation needed to contemplate radical organisational change is greatly increased. Their model is supported by Rothwell and Zegveld (1985) who described how the British chemical industry in Victorian times became a classic victim of this so-called 'technological lock-in'. Innovative methods of alkali production were adopted by newly industrialised nations that soon became more cost-effective than the method traditionally used in Britain. British firms were reluctant to abandon their own process in which considerable sums of money had been invested, and instead responded by making incremental changes to improve efficiency and entering into price-fixing agreements. Another theory which is closely related to the Abernathy and Utterback product/process model is the notion of *'increasing returns'* (Arthur 1994). He

explained how a successful product could become even more successful once a critical mass of people were committed to buying it. Technological standards also tend to become 'locked in' by such positive feedback. A good example of this would be the ubiquitous Microsoft operating system that compels users to run Microsoft's Windows software, so that increasing hardware sales lead in turn to increasing demand for software. The positive feedback created means that competitor products cannot become established even if they are cheaper and of better quality. Parallels can clearly be traced here with the current position in the banking industry, a theme that will be developed throughout this thesis. For example, the traditional payment systems have become so entrenched over time that industry newcomers face a difficult task in trying to establish radical alternatives.

In contrast to the product/process model, Barras (1990) proposed a model of innovation that began with incremental process improvements and ended with radical changes. He used examples from the financial services industry to devise a model that was likened to the usual marketing concept of product life cycle, but in reverse. He concentrated upon the interaction of technical possibilities, market demand and organisational structure - features which he claimed formed the crucial drivers of technological change. In the Barras model, early innovations in the banks are incremental in nature, with the major objective being increased efficiency. This is achieved by cost control and staff reductions, as a result of investment in new technology by established firms delivering mature services in saturated markets. (Examples of the historical development of information technology within the banks are described in Chapter 5.) The second stage of the model involves more radical process innovations that improve quality and effectiveness. Barras used the examples of SWIFT and ATM development to illustrate the extent of standardisation possible, as such products converge towards a dominant design and economies of

scale. He also described the danger of 'technological lock-in' at this stage, where the scale of the investment, and the extent of associated expertise generated, make it difficult for the banks to consider viable alternatives. In the third stage of his model, the emphasis is moved to differentiation as entirely new products are generated and the organisational structure transformed. Barras used the example of 'home banking' to support his claim that as the momentum of this wave of innovative activity grew, banks would lead the whole economy towards a new phase of growth and development. He predicted that at this more radical stage the costs of market entry would fall and the competitive threat increase from smaller, entrepreneurial firms - which are not compromised by structural rigidities based upon earlier investment and the associated entrenched knowledge base.

Some writers have criticised the Barras model as overly simplistic and deterministic, because it places little emphasis on the impact of cultural factors on successful technological innovations and the need for active management of expertise within the organisation. Scarbrough and Lannon (1994) noted that specialised functions developed to manage existing technology often acted as barriers to the development of more radical alternatives, but they questioned the value of a definitive model which attempts to homogenise the disparity of circumstances in which specific organisations operate. Their research at Bank of Scotland identified 'historical precedent' as the major determining factor of organisational approaches to innovation. The successful implementation of the projects they studied was specifically dependent upon the interaction of cultural, structural and political issues within the organisation. These considerations rendered each example of technological change organisationally unique and context-dependent - therefore not amenable to standardisation and the application of a model. In particular, the third stage of organisational transformation would appear to be difficult to engineer in

these circumstances. Barras gives little indication of timescale for the different stages of his model; indeed, some years on from original publication, this thesis will demonstrate that the competitive threat has certainly increased but there is as yet little evidence of transformation in banking structures.

Despite these criticisms, there are some developments in the banking industry which bear a strong resemblance to certain features highlighted in the Barras model of innovation. These are discussed in more detail in Chapter 5. Briefly, Vamham (1994) described how the European Community Commission has encouraged commercial banks, so far without success, to improve and standardise their payment services across Europe with the ultimate objective of implementing a single European currency. Instead, the banks' attention remains focused upon preservation of traditional business in their respective domestic markets. Specific efforts to improve payment systems concentrate upon refinement of existing systems that are dependent on international 'correspondent' relationships between banks. The practice has changed little in principle since its inception in the Victorian era. This evidence would place European Payment System developments squarely in the initial incremental stage of the Barras model. The banks have invested considerable sums in the SWIFT network, the inter-bank electronic delivery mechanism for payment instructions. It also represents a massive investment in terms of specific organisational structures and knowledge bases, which does not encourage the exploration of possible alternatives that are derived from outside this particular paradigm. This common inhibitor to innovation forms another example of technological lock-in, but Barras does not consider how the banks are expected to overcome this problem and move onto the next stage of organisational transformation. The ways in which the banks are managing technological change in

order to address the problems of technological lock-in will be addressed in the empirical study.

TECHNOLOGICAL CHANGE

The notion that technology has a form and momentum of its own which instigates organisational and environmental change has been widely expressed. This viewpoint has become known as *'technological determinism'* and the origin of the idea has been largely attributed to Woodward (1970 and 1980). In the same tradition, Levitt (1983) claimed that technological advances in themselves provided a driving force towards globalisation of markets for standardised products on a vast scale, regardless of social or economic conditions. Such accounts are essentially determinist in nature, and can be criticised for ignoring both the social aspects of technology and its application within organisations (see for example, Wilkinson 1983 and MacKenzie and Wajcman 1985). The theory disregards the impact of managerial choice in respect of technological decisions (Child 1972) and assumes no conflicts of interest exist between managers and employees, or indeed between individuals within either of these groups. It also appears over-optimistic in its assessment of both the extent and immediate proximity of the economic benefits created by technological developments. For example, although it was mentioned earlier that the financial services industry has been a massive investor in new technology over the past 30 years, there is as yet little sign of Levitt's prediction of increasing homogeneity in the products and services offered across organisational and national boundaries.

Despite the ambitious claims of the determinist viewpoint, a review of the technology literature soon identifies a recurring theme that organisations can only benefit fully

from the potential of a new system if work practices, organisational structure and company culture are flexible enough to adapt. Galbraith (1974) established at an early stage that if an organisation is to benefit from technology, it must be structured in such a way as to allow effective information processing, and be flexible enough to respond to changes in the environment. Research by Kaplinsky (1984) and Kling (1991) in a variety of industries, found little evidence of substantial social change as a result of technological advances. They both characterised the change process as *'slow and incremental',* constrained by political activity and resistance within the organisation. In the introduction to the new edition, March and Simon (1994) reflected back over 35 years since initial publication of their theory of 'bounded rationality' as a constraint on organisational change, and concluded that it was still valid today. This was despite the growth of information technology over the period, and the vastly increased resources available to the modern organisation, which sought to reduce the restrictions on rationality imposed by the cognitive limitations of people within organisations. The authors acknowledged the power of IT to transform mathematical functions, but claimed that:

> *"...the work of managers at higher levels has not been much changed despite frequent proclamations of an information technology revolution.*" (p.10)

In other words, they believed that IT cannot overcome organisational constraints in a deterministic manner, and is itself shaped and bounded by its developers and users. Watson (1980) provides a useful summary of these arguments:

> *"Technology is only a means, it is a piece of machinery or equipment with an associated technique which is used for carrying out certain tasks. Developments in technology may have massive implications for individuals*

and for society at large. Those implications only arise when people choose to adopt them and apply them to achieving human ends. Technology is no force in its own right. To talk of 'the iron hand of technology'... is to avoid the important and necessary question of who is applying technology and to what ends." (p. 77)

In MacKenzie and Wajcman's (1985) study of the social influences upon technology, the authors claimed that a new technology is created in the context of existing systems, and only appears radical with the benefit of a historical perspective which filters out less successful alternatives. They criticised the idea that a technology can be 'invented' as a single inspiration in isolation of the influence of existing practices by noting that historical analysis allows the benefit of hindsight to trace a particular invention back to a single inspirational source. In reality, competing projects may have overlapped and been developed concurrently, but only the story of the 'winner' survived the passage of time. In support of this claim, the writers cited Ogburn and Thomas (1922), who argued that technological developments were an inevitable result of the synergy created as innovators merged technological capability and contemporary artefacts within new contexts. They concluded that the major constituent of new technology was the existing process, often applied in new situations and modified in an incremental fashion over time by many developers working independently. A number of writers have supported this theory, notably Gilfillan (1935) in his study of the development of the ship, and Hughes' (1979) analysis of the development of electricity. By regarding both technological capability and human influence as central to the innovation process, this viewpoint discredits more deterministic accounts of the impact of technology which were reviewed above. A current example, described in more detail in Chapter 5, is the growth of the telephone banking market led by First Direct. The basic banking products that are

offered remain the same, but the delivery mechanism still appears radical to some market segments.

Sociologists of technology such as Grint and Woolgar (1997) have taken the argument even further. They accorded no independent design or role to technology in the organisational change process at all, claiming that both its characteristics and use were entirely *'socially constructed'*. While this may be regarded as a rather extreme and impractical position to take, the evidence presented above from a diverse range of sources suggests that the influence of specific organisational factors appears to render each example of technological innovation unique, thereby discounting any significant 'independent impact' of the technology itself. McLoughlin and Clark (1994) pointed out that this does not imply that technology has no influence upon the nature of organisational change, but that it is only one of many interacting and complex factors. They concluded that effective introduction of new technology required challenge to conventional prerogatives and commitment from all levels of the organisation, and even then the results tended to be evolutionary and emergent. This means that it is difficult in practice to apply definitive models of innovation such as the 'reverse product life cycle' suggested by Barras (1990) and described in the previous section. Similarly, rational and linear models (for example strategy development, implementation, evaluation) favoured in traditional organisational change texts such as Chandler (1962) or Ansoff (1984) appear very limited in terms of their ability to explain the dynamics of change. In addition, Lewin (1951) saw change as an event that could be sequentially managed by 'unfreezing' existing attitudes, executing a change programme, and then 'refreezing' behaviours around the desired outcome. The next section addresses the complexity of change management and the limitations of such models by focusing upon change as a process to be managed rather than an event.

THE PROCESS OF TECHNOLOGICAL CHANGE

A concern with the way that the introduction of new technology is mediated by social factors within organisations as described above focuses attention upon the process of technological change. Boddy and Buchanan (1986) criticised the notion that change can occur overnight rather like a 'big bang', and instead argued that:

> *"The introduction of a new machine usually involves a long period of planning and preparation before its arrival; modifying it and improving it once installed; and training staff to use and maintain it. The effective introduction of even comparatively minor technical changes is thus protracted and fragmented, and involves a lot of formal and informal negotiation."* (p.9)

Some writers have attempted to categorise a series of intermediary stages in the technological change process. For example, Clark et al (1988) identified initiation, decision to adopt, system selection, implementation and routine operation as the critical steps. Dawson (1993) showed that while these stages are helpful in analytical terms, the process is often anything but linear in practice. Organisations may revert to an earlier stage of the process if problems are experienced, or indeed may experience two stages simultaneously. In a later work (McLoughlin and Clark 1994), the authors agreed with this finding, but contended that it was still possible to use such a model to distinguish *'critical junctures'* of the change process at which managerial choices could be negotiated, thus having critical influence upon particular outcomes.

Buchanan and Boddy (1992) showed that even incremental change projects, once underway, may take on strategic significance as circumstances and priorities within the organisation develop over time. The potential of individuals to influence the direction of the technological change process does not, of course, end once actual implementation is completed. The considerable capacity for post-adoption shaping of a technology has been detailed by Fleck (1993), who noted that in addition to the expected incremental improvements over time, further distinct innovations may be precipitated once the technology is actually in use.

The complexity of change illustrated by the work described above emphasises the limitations of the linear models of change that were discussed in the previous section. Pettigrew et al (1992) sought to develop a more robust model that could capture the dynamics of the change process. They concluded:

"Finally, the central assumption about causation in this kind of holistic analysis is that causation of change is neither linear or singular - the search for a simple and singular grand theory of change is unlikely to bear fruit. For the analyst interested in the theory and practice of changing, the task is to identify the variety and mixture of causes of change and to explore through time some of the conditions and contexts under which these mixtures occur." *(p. 269)*

Dawson (1996) applied these ideas more specifically to technological change and distinguished three key 'determinants' of change, namely substance, context and politics. He noted how the importance of these factors to the change process lay not in the distinctions between them but in their continual interplay over time through the actions of 'change agents'. Such individuals are able to secure both the capacity and

legitimacy for change by political action. (For a more detailed study of the role of change agents, see Buchanan and Boddy 1992).

While these process models of change seem to enhance understanding of organisational change, Buchanan and Boddy (1992) pointed out that complex and abstract models have limited use for practising managers. They sought to address this issue by identifying the specific expertise necessary to be an effective change agent in practice. The critical skills they noted were technical skills, project management skills, and political and cultural skills. These areas were categorised by the authors as corresponding to the 'content', 'control' and 'process' agendas of change. Buchanan and Boddy found that the priority change agents attached to these skill areas varied depending on two things: how critical a change programme was to the key activities of the organisation, and also how radical the change was perceived to be in comparison with earlier practices. The more central and radical the change programme, the more vulnerable the change agent was to implementation problems that were political in nature rather than technical or project management related. In such circumstances, therefore, the authors recommended that change agents should focus their efforts upon the process agenda rather than upon content or control issues. This means addressing internal communications, team building, neutralising resistance, enrolling support and resources, while at the same time being cognisant of the culture and history of the organisation. The role of change agents is considered in more detail in Chapter 8 which examines the subject of leadership in the case study banks.

THE FOCUS OF THE THESIS

This chapter has described a number of theoretical positions that have been taken on the nature of technology and technological change. For the purposes of this thesis the pragmatic assumption will be made that the development and implementation of new technologies is influenced by both technical capacity and specific organisational factors. Therefore the idea of Clark et al mentioned above that technology can be regarded as a combination of technical and social influences will be used and developed throughout. Clearly, the acceptance of any definition and role for technology which acknowledges organisational constraints on the development of new technology systems implies that the chance of success can be enhanced by appropriate and effective management, rather than by adherence to a particular model. The scope for human influence was also highlighted in the discussion of technological change as a process, whereby opportunities for intervention and negotiation by management to influence outcomes exist at a number of distinct stages over time. Again, this concept will be drawn upon throughout the study. Contemporary case studies provide the rich detail necessary to illuminate these issues.

The notion of what exactly is meant by 'productivity' and how it can be measured has also been questioned in this chapter. Quantitative studies focusing upon measurement of productivity changes imply that new technologies have deterministic characteristics in the sense that specific inputs and outputs can be identified and compared. Although useful in as far as it goes, this method provides only a limited guide to the overall effectiveness of a new technology. It ignores more qualitative

changes such as, for example, improvements in service quality, as well as the related benefits that may accrue in other parts of the organisation. It seems that a more holistic overview of technological change is required, encompassing the wider organisational issues and management implications, to provide a realistic picture of technological innovation. This myriad of social influences is difficult to 'measure' in the conventional sense of productivity improvements, but the issues can be illuminated by qualitative study of detailed cases that interpret productivity in a broader sense than is conventionally found.

Hence the focus of this study is upon analysis of empirical data from examples of technological change management in the financial services industry, with the objective of identifying particular organisational features which either inhibit or facilitate IT project success. It is hoped that the analysis of these micro-level cases can inform the wider theoretical debate about the reasons for the existence of the IT productivity paradox, and that practical lessons can be drawn upon by managers to guide the successful introduction of future new technology projects.

CONCLUSION

This chapter has considered the wider issues that impact upon the study of technological change in the financial services sector, and justified the analysis of detailed case studies as the most appropriate method to address the chosen research question. The major points raised can be summarised as follows:

- At the macro level, technological change is necessary for the competitive position of any industrial nation to be maintained over the longer term. Despite

recent technological developments, the economic status of the UK has continued to decline in global terms, suggesting that dysfunctional management of technological change may be taking place

- As major investors and developers of information technology, service industries such as banking should be playing increasingly important roles in the process of technological change, but there is as yet little evidence of productivity gain despite the levels of investment made

- At the micro level this could mean that opportunities exist for organisations to utilise the potential of information technology more fully and hence secure competitive advantages

- In practice this potential appears to be inhibited by lack of accountability, a focus upon automation of existing practices, ineffective management of new technology projects and 'patching' of obsolete technologies

- The prominence of social and political issues (as opposed to technical constraints) throughout the implementation of new IT projects highlights the critical need for effective management of the technological change process

- In such circumstances, a focus upon quantitative measures of productivity changes has limited explanatory power in comparison with a detailed study of contemporary case studies that illuminate the social and political processes involved in technological change management

In summary, the thesis to be investigated is that the difficulty of translating technological opportunity into increased productivity is related not so much to technical failings, as to the way in which implementation is conceptualised and managed within adopting organisations. It is hoped that the study will lead to an advance in knowledge of how implementation may be better conceptualised, understood and managed.

CHAPTER 3 - THE UK BANKING INDUSTRY

INTRODUCTION

This chapter illustrates the diverse range of innovative activity that is taking place in the industry. It begins with an historical review of the development of the UK financial services industry, with the aim of placing the theoretical issues raised in the previous chapter in the context of the specific industry to be studied. This material is largely taken from the author's own knowledge which was accumulated during a ten year period of full-time employment in a UK retail bank. The next section of the chapter summarises the current structure of the industry, before reviewing recent inroads by industry newcomers - namely technology companies and retailers - into this hitherto sacrosanct territory. These companies appear to be utilising technological opportunities to devise innovative products and radical delivery channels. They include Microsoft, which is investigating innovative payment systems that can be used in conjunction with the Internet, and retailers such as Sainsbury or Tesco, which aim to position themselves in direct competition with the high street banks. The activities of these new competitors are still at a very early stage, but each of the companies mentioned has the advantage of a massive customer base and quality reputation upon which to draw in search of viable diversification strategies.

Two other major new initiatives, namely telephone banking and electronic purses, are described in Chapter 5 which introduces the empirical case studies. This is because they form the subject matter of the First Direct and Mondex case studies respectively. The chapter concludes by considering the potential impact that successful developers of new technological innovations may have upon the structure and operations of the traditional UK banking industry. It remains to be seen if the banks

are capable of discarding established industry norms and changing their historical structures and functions in order to respond to the competitive challenge The prospects of the various players will be assessed through analysis of the empirical case studies in later chapters.

HISTORICAL REVIEW

As described in the previous chapter, Hutton (1995) blamed the structure of British finance for the comparative failure of Britain to exploit technological developments such as chemicals, electricity and combustion engines in the late 19th Century. The pivotal role occupied by banks in society means that their fortunes are inexorably linked with those of the country as a whole, and the cultural characteristics of the financial services industry today have themselves been defined and moulded by national economic and social policies over the past 150 years. Banking in the UK has evolved over the past 200 years into a highly specialist community, which is commonly described as 'discreet', 'conservative', 'stable', 'traditional', 'secretive', and 'imposing'. This image has been deliberately cultivated by the banks as it is seen to befit custodians of the wealth of others.

The standard organisational hierarchy of authority found within the banks was developed in the Victorian era, and it followed a military model of organisation. This ensured that strategies were developed from the knowledge and experience of the company leaders, then imposed throughout the organisation by means of the authority vested in successive layers of management, and finally translated into action by workers at the base of the hierarchy. Seniority tended to be measured in terms of length of service and the consequent level of accumulation of internal knowledge, and only this warranted the privilege of strategic thinking. In a wide

application of 'Taylorist' scientific management principles, workers were employed to perform routine tasks to an established pattern, and traits such as discretion and initiative were discouraged. A bureaucratic approach to office work and administration which stressed qualities of order, precision, hierarchy and authority was considered particularly important in the banking industry, as banks sought to present a sober and efficient image that reflected their role and status in the economy. As a result of the pervasive application of these working practices, creativity was stifled and risk avoidance came to be more highly valued than innovation. Some banks went so far as to create lengthy rulebooks. These weighty tomes detailed exact and standardised procedures to be followed in particular business circumstances. Unfortunately, even if every possible task could be accounted for, this policy made no allowance for adaptations to rapidly changing technological and market conditions. This scenario appears to exemplify the 'mechanistic' (or bureaucratic) system of management made famous by Burns and Stalker (1961) which the authors deemed to be appropriate only for stable operating conditions.

In Victorian times a number of small banks operated in a competitive market, but after World War 1 a series of mergers and acquisitions resulted in the establishment of just 5 major players who between them accounted for 80% of total bank deposits. The banks held no industrial securities, all of this money was invested in the London discount market or stored as cash. The economies of scale and potential for co-operation generated by the mergers made it difficult for newcomers to enter the market, and the resulting oligopolistic structure became a source of stability, growth and profitability for the major players. The Bank of England was nationalised in 1946 and charged with regulation of the banking industry to protect the integrity of the financial system in the UK, and hence maintain confidence and stability in the

economy as a whole. It became a 'lender of last resort' to individual banks in difficulties, and was also responsible for enforcing government policy in the financial markets. The special position that the Bank of England developed as an intermediary between the state and the commercial banks, and its insistence upon self regulation within an industry 'closed shop', have been blamed for many of the restrictive practices that continue to dominate the banking industry to this day. Recent attempts to widen 'the club' to include building societies, for example, were resisted strongly by industry incumbents. In addition, a strong ethic of co-operation existed in the labour market as the banks co-ordinated pay and conditions, entry requirements, union recognition policies and formal 'no-poaching' agreements.

The market for banking products increased during the 1950s as more and more people opened accounts to receive the automatic payment of salaries. This resulted in the rapid growth of the branch network to meet demand, and the introduction of innovative services such as personal loans and credit cards. The co-operative ethic between the major banks was threatened in 1971 by Competition and Credit Control, a document issued by the Bank of England, which abolished lending ceilings and the agreement between banks to offer uniform rates to borrowers and lenders. Market forces could therefore operate in the industry for the first time. Competition from building societies, which had begun to intensify in the 1970s, became particularly acute in 1986 when the Building Societies Act allowed their product portfolio to be extended to include cheque accounts, personal lending and foreign exchange services. In turn, the banks began to move into the lucrative mortgage market that had previously been the preserve of the building societies. They also diversified into estate agencies and travel services, often with expensive consequences.

INDUSTRY REGULATION

The 1980s witnessed an unprecedented period of regulatory change. This can be interpreted both as a response to changing market conditions and also as a catalyst for further sweeping changes in the financial services industry. Fincham et al. (1994) noted how regulation of the financial services sector was an important part of government economic policy, because of the centrality of the industry to the performance of the economy as a whole.

The 1984 Gower Report on Investor Protection formed the basis of the current industry structure. The motivation for regulatory changes in the financial sector partly came from the political perspective of a need for fair trading and consumer protection, following a number of spectacular collapses such as Johnson Matthey Bankers (1985), and the Bank of Credit and Commerce International (1991). Another important factor was the increasing influence of new market entrants such as Marks and Spencer that were not subject to the same level of supervision as the established players. The other factor leading to reappraisal of the regulatory system was concern that the increasingly international nature of financial markets was not matched by standardisation of operating conditions in the countries involved. Piesse et al. (1995) noted that these seemingly worthy aims were to some degree compromised by the high cost of regulation, the threat to competition that restrictions impose, and the opportunities presented for illegal activity in the form of circumvention of regulation or distortion of market principles. The authors showed how these issues were addressed by focusing new legislation upon authorisation, supervision and compensation. Possession of a banking license was essential for financial business to be undertaken, and this could be revoked if reporting and disclosure requirements were not met. Generous compensation for private investors

was also made available in the event of fraud or misconduct. These conditions were laid down in the 1986 Financial Services Act and the1987 Banking Act.

The objective of these legislative changes in the 1980s was to change the scope of regulation, by shifting regulatory responsibility from the state to the banks themselves. Many legal constraints upon the type of activities that could be espoused by the different market players were removed, and enforcement became increasingly dependent upon self-regulation. This was because the rate of change in the industry had become so great that flexibility was regarded as the key to effectiveness. A complex legal structure would have been too ponderous to respond to changing demands. Additionally, the involvement of practitioners in rule formulation and enforcement was intended to encourage compliance and the maintenance of high standards of conduct. The end result manifested into a climate of deregulation on the one hand, in which trading restrictions were lifted so that the banks became free to develop new services and exploit new market segments. On the other hand they became subject to more stringent reporting requirements under the supervision of the Bank of England. The consequences of operating in an increasingly dynamic environment of regulatory change, technological developments and threats from new market entrants are explored in the next section.

COMPETITION AND COLLABORATION

As deregulation allowed the banks to move into the mortgage market, the building societies in tum began to offer competitive deals on current accounts which included standing order and direct debit services. The banks, (led by Lloyds and soon copied by the other major players) responded by offering free banking to customers in credit and even paying credit interest in some cases. Howells and Hine (1993) noted that

providing special interest bearing accounts had cost the 'Big Four' clearing banks £0.5 billion by 1990. The banks sought to recover lost revenue by increasing charges on customer correspondence, thereby losing significant amounts of goodwill amongst their customer base; a disturbing situation which still prevails to this day. In this climate, Automated Teller Machines (ATMs) were also initially seen as a way of controlling costs and improving productivity by automating tasks previously performed by cashiers. In practice, the high set up costs and considerable, (if intangible) marketing benefits associated with the provision of this service made productivity changes difficult to measure. Scarbrough and Lannon (1994) showed how Bank of Scotland lost significant market share by being slow to introduce ATMs in comparison with their competitors. However, once all the major banks offered automatic cash withdrawal services, ATMs ceased to offer competitive significance and more collaborative strategies were adopted. This enabled reciprocal arrangements to be put in place allowing customers of one bank to use another bank's ATM network.

Other examples of more intentional inter-industry collaboration to automate payment services during the 1980s included the establishment of inter-bank clearing systems such as BACS and CHAPS, and an ambitious project called EFTPOS (Electronic Funds Transfer at Point Of Sale) which aimed to create a national electronic system linking retailers with the banking system. A detailed study of EFTPOS developments by Howells and Hine (1993) showed how the collaborative network of bankers and retailers broke down in the face of competitive pressures, distrust and lack of expertise between the parties involved. A common clearing system was never established and a number of competing 'debit card' schemes developed instead. These projects are mentioned here to illustrate the diverse range of innovative activity that has taken place in the banking industry in recent years. The EFTPOS

case will be examined in more detail in later chapters that study the problems the banks have experienced in managing large technological change projects.

THE UK BANKING MARKET TODAY

The Bank of England continues to dictate that only *'licensed and adequately supervised institutions'* are allowed to participate in payment systems. Possession of a banking licence is therefore still a prerequisite for money transfer using the traditional networks. Attempts to break down the remaining barriers to market entry, and thereby extend membership of the 'club' are strongly resisted by traditional banking industry incumbents. This defensive and protective attitude by the banks towards their existing payment systems is prompted by the possible future impact of innovative payment mechanisms that are not dependent upon membership of CHAPS or other national clearing systems. A recent report (1995) by Deloitte Touche Tohmatsu International quoted in The Financial Times summarises the attitude of the banks and the problems with which they are faced:

> *"...banks which hide within the supposed safety of protective barriers and monolithic structures face daunting challenges." (p.9)*

The European Monetary Institute has demanded that issuing rights for digital cash are restricted to licensed credit institutions, but this is likely to be unenforceable. Banking regulators prefer the smart card developments by the credit card companies to the electronic cash facilities such as Mondex, (see Chapter 5). This is because the centralised clearing system used in the credit card industry is established and secure. Each transaction is recorded and money cannot be transferred from individual to individual. Some banking services cannot be offered through electronic

media for legal reasons; for example, the Consumer Credit Act prohibits the establishment of online loan facilities.

Structural changes in the industry continue to dominate the headlines. Recent acquisitions by Lloyds Bank include TSB and Cheltenham & Gloucester Building Society, and the Halifax and Leeds Building Societies have also merged their operations. The Halifax has now shed its mutual status and become a bank, allowing the provision of a full range of financial services. These significant structural adjustments in the industry reflect an increasing tendency for the major players to attempt to differentiate themselves from the competition, in a market where the services provided have come to be regarded merely as utilities. In these circumstances the banks view information technology as their major potential source of competitive advantage. A brief history of the banks' use of new technology is provided in Chapter 5, to introduce the empirical cases and place the specific projects studied into a broader industry context.

The bank branches now operate with fewer staff, but the skills required are very different from those of their predecessors. It has been estimated by Denton in the Financial Times (1995) that the number of bank branches in the UK will be reduced by 9000 by the year 2000, at a cost of some 50,000 jobs. This is in addition to the 59,000 jobs that have already been shed by the big four clearing banks since 1990, leaving approximately 270,000 staff in employment at the end of 1995. Expected productivity improvements from reducing staff costs have not materialised because Denton showed that 20,000 jobs have at the same time been created in the developing telephone banking market. Additionally, the banks have recruited IT specialists at significant cost. The problem of IT skills shortages is becoming more acute as the banks grapple with preparations for both the Euro and the 'Year 2000'

problem. Staff with the necessary skills can name their price in these unprecedented market conditions.

The first part of this chapter has illustrated the broader industry context by highlighting the rapidly changing environmental conditions in which the banks are operating. The historical review showed that the traditional banks can be regarded as 'mechanistic' structures in the terms of Burns and Stalker, which means a type of organisation best suited to stable operating conditions. The next section reviews recent inroads by newcomers to the financial services market. Such organisations tend to exemplify the features of Burn's and Stalker's 'organic' structures that appear to be more suited to effective operation within these turbulent environmental conditions.

INDUSTRY NEWCOMERS

INTERNET BANKING

The Internet has an estimated 30 million users world-wide and 1 million in the UK. It is widely accepted to be growing at a rate of 10 percent a month, although the figures are impossible to verify. It is also expected to become an important medium for settling financial transactions world-wide once reliable security encryption mechanisms are in place. Hawkes (1995) writing in The Times, quoted a report by the analysts Killen and Associates which predicted that money transactions through the Internet would expand to £380 billion a year by 1999. Recent reports by Booz-Allen and Hamilton and Ernst and Young (1996) highlighted the threat posed by the Internet to the operations of the traditional banking oligopoly. Both companies expect Internet banking to become an important distribution channel within the next three

years. Ernst and Young's Report on Technology in Banking claimed that banks are struggling to exploit the benefits of virtual banking and stand to lose a substantial part of their business unless they adopt their processes and expand their product range.

The data in this section is taken from the Financial Times IT in Banking Survey (1996) which reports that some 500 banks are now represented on the Internet, from a zero base in 1989. Most banks still use it purely for marketing purposes, and have invested in elaborate electronic versions of the ubiquitous 'glossy brochure' which has little serious content. The US market research firm Input estimates that only 3% of large banks actually do business on the Internet at present, but the company predicts that 90% will be using it for electronic commerce by the year 2000. Wells Fargo was one of the first US banks to offer a web site service to its customers in 1995. Initially only account data could be checked, but customers can now send payments to any US destination, set up regular bill payments, transfer funds between accounts, and check whether cheques have been cleared. In May 1995 three American banks - Wachovia Corporation, Cardinal Bancshares and Huntingdon Bancshares - together launched a 'virtual bank' called Security First Network Bank, the world's first full banking service on the Internet. Customers are able to access their accounts and write electronic cheques through an arrangement with the electronics payment firm Checkfree. The most advanced UK bank site is Barclays, which has formed a 'virtual shopping mall' called BarclaySquare in conjunction with a group of retailers, and accepts credit card payments on-line. According to Taylor (1996) writing in the Financial Times, Barclays set this site up to learn more about the online business, and at the same time find out which of its customers were interested in electronic shopping. The intention was to establish the bank as an innovator in the field. Visa International is also about to pilot an Intranet project (a private and localised network based upon Internet technology) in the USA. This system will

connect all of Visa's 19,000 member banks throughout the world, which will benefit from using the shared on-line information to improve service quality.

While press attention has focused upon the efforts made by banks around the world to jump on the Internet banking bandwagon and utilise the unique marketing opportunities that it provides, relatively little consideration has been given to the difficulties still associated with the Internet. For example, the uptake of Internet banking services is limited by the number of Internet users in the country concerned. In the UK, a recent survey by ICL financial services found that only 11% of the UK population had access to the Internet, and less than 25% of these people claim to be regular users. Although the market is growing rapidly, the number of current users still represents only a fraction of total retail banking customers. In addition, the infrastructure of the Net is now so overloaded that service quality can be poor or non existent at busy times of the day. Internet service providers are losing money as they compete for new users, and so are reluctant to pay vast sums of money to the telephone companies to upgrade the access networks. The biggest problem facing the banks, and one that may yet destroy customer confidence and thwart all of the ideas mentioned in this chapter, is the threat posed by computer hackers. Incidents have occurred where even the proprietary systems of banks have been penetrated, so it would be comparatively easy for fraudsters to access them via such an open network as the Internet. Considerable sums are being invested in the security of electronic money transmission systems, but the danger of fraud by internal or external elements always remains a possibility. In these operating conditions, an organisation such as the successful telephone banking operator First Direct, which prides itself upon quality service, is still reluctant to introduce Internet banking.

TECHNOLOGY COMPANIES

It is sometimes argued that computer-based banking services will remain a niche market because a large proportion of the UK population are not computer literate and prefer to deal with bank employees face to face. This appears to be a rather short sighted approach because a growing number of banking customers and staff have grown up with computing facilities and are comfortable with new technology. The world's leading computer companies are trying to get a foot in the door of the growing on-line banking market. In April 1995, Microsoft made an abortive attempt to purchase Intuit, an American software company whose star product, called Quicken, allows PC users to deal on-line with their banks. Microsoft's attempt to buy Intuit actually boosted the smaller firm because it made the banks take it more seriously. Intuit is the market leader in personal finance software with 75% of the US market, and in June 1996 it announced the creation of BankNOW, an on-line system which will link six million subscribers with participating financial institutions. Intuit's relationship with the banking industry is becoming increasingly complicated, as banks currently pay Intuit a licence fee to connect Quicken users to their bank accounts, but the Web-based banking services under development by the banks will be in direct competition with Quicken. Microsoft Money is a direct rival to Quicken, and Microsoft secured the co-operation of 58 banks in July 1996 to support on-line banking with its Microsoft Money 97 personal financial software. In September 1996 IBM announced a deal with 15 major US banks to develop an electronic banking network called the Integrion Financial Network. It will offer interactive banking to a combined customer base of 60 million households in the US and Canada, and IBM aims to prevent the possibility of Microsoft or Intuit coming to dominate the industry. By establishing links with technology suppliers, the banks involved can control costs by providing a shared infrastructure and transaction standards, and at the same time maintain bank

branding of services which run the risk of being hijacked by industry newcomers. This brief review shows that In line with the relative market penetration of electronic banking in the US as compared with the UK, the American banks at present are being far more proactive in this field than are their British counterparts. Even in the US, electronic banking accounted for only 1 per cent of banking transactions in 1995 (Graham 1996).

RETAILERS

Supermarkets are targeting financial services to find new sources of profit to offset the maturing UK grocery market. They are also well placed to exploit the banks' poor reputation for customer service that was noted in an earlier section of this chapter. The UK retailer Sainsbury announced a partnership with Bank of Scotland in November 1996 to offer deposit accounts and credit cards to its massive customer base. By late 1998 it is intended that a full range of banking services will be offered by a combination of telephone operations and in-store cash dispensers. As the provider of a new service, Sainsbury is free to select certain banking products that it perceives will add value, without needing to offer the loss-making services such as cheque accounts that retail banks are obliged to provide. By the same logic, it can target the banks' most profitable customers from its large pool of regular shoppers and ignore the remainder. Tesco has a similar arrangement with Royal Bank of Scotland, and by May 1998 the retailer had opened 1 million deposit accounts with total balances exceeding £2 billion, (Financial Times, 16th May 1998). The main attraction to customers is the generous rate of credit interest, (currently 6.5%) which is way in excess of the rates offered by the traditional banks. Sainsbury is now considering a move into the mortgage market and Tesco into pensions. The same article reports a prediction by analysts from Merrill Lynch that the two supermarkets

will produce combined annual operating profits of £300 million just from financial services by 2003.

THE FUTURE OF BANKING

Gates (1995) has made no secret of his belief that the convergence of money, commerce and personal computers represents one of the great new markets of modern times. As early as 1985, Frazer noted the likely implications of technological innovations in financial services:

> *"Electronic banking... has a significance that goes well beyond simply making payments more efficiently. It could become a major battleground between banks and new competitors anxious to invade their territory, with important implications for the shape of banking in the future." (p.5)*

Similar claims were made in a recent report by Price Waterhouse (1996) on the challenge of 'virtual banking':

> *"A new generation of non-bank competitors poised to harness new forms of technology could radically alter the structure of the traditional banking system as we know it. Today, opportunities are being exploited by software companies, consumer companies and even large and influential media owners. The threat to the traditional 'bricks and mortar' banking system is very real." (p.3)*

Warner (1996) writing in the Independent, summarises the current market position as follows:

"For the time being the old dinosaurs of banking are making record, many would say excessive, profits. A new, smaller, faster moving reptile is waiting in the wings. Twenty years from now, they may have inherited the earth." (p.16)

Despite these warnings, the banks are in a strong position because of the sheer size of their customer base and detailed product knowledge. Graham (1996) noted that although the banks have a huge volume of customers who may be reluctant to go to the trouble of changing their established banking arrangements, and still enjoy considerable regulatory protection, these advantages are hardly indicative of operating effectiveness. It remains to be seen whether the banks can be flexible and innovative enough to exploit their advantages and respond positively to the competitive threat from industry newcomers. At the very least, they need to increase their levels of IT expenditure still further while focusing upon obtaining the full value from their investment. This issue is explored in detail in Chapter 5.

At this stage it is difficult to predict the likely extent of change in the structure of the industry, and also important to bear in mind the cautionary note described in the introductory chapter against the common tendency to exaggerate the potential of new technologies, (Flannery 1996). It is clear that the benefits to the consumer in terms of increased choice and efficiency are likely to be considerable. The debate about the future role of the banks will be informed in later chapters by analysis of empirical data, which will enable comparisons to be made between the strategies of banks and industry newcomers with respect to technological innovation. This thesis will examine these issues in the context of current activity in the banking industry, as a number of industry newcomers challenge established norms. As shown in the

previous sections of this chapter, some of these organisations are contemplating radical change and believe that precedent should not necessarily decide either the direction or define the actual providers of new business practices.

In contrast, it will be argued in later chapters that an 'anti-innovation' culture still prevails within the traditional banks and encompasses the dealings that they have with both clients and their own staff. This attitude appears to have become so ingrained in the retail banking industry that attempts to introduce radical changes in working practices based upon new communication technologies have so far been both belated and half-hearted. This is noted by Dougherty and Hardy (1996) in their examination of the problem of sustaining product innovation in mature industries. They claimed that it was relatively easy for such a company to come up with a single innovative idea, but much more difficult to manage the creation and development of a number of new ideas over time:

> *"Sustained product innovation is particularly difficult for organisations with long histories of stable operations...long-stable organisations are especially challenged by changes in technology and global competition: they must become more innovative if they are to survive, but to do so they must fundamentally change how they organise."* (p.1120)

The banks still tend to regard this viewpoint as heretical, although there are some signs that attitudes are beginning to change. For example Graham (1996) writing in the Financial Times, quotes a Citibank executive by the name of Jim Bailey who used an analogy with the ice-makers that once brought ice to India:

> *"Not one of those companies survived to become refrigeration manufacturers. We cannot afford to be like the ice-makers." (p.11)*

Although one of the largest banks in the world, Citibank has a particular reputation for conservatism. It would make an interesting study of technological change if its leaders really are determined to transform the organisation in this manner.

Mondex and the credit card companies are owned by the banks, so some means of control can be placed upon their activities. This is not the case with the technology companies that are working alongside banks as partners in the development of new payment systems, or the retailers keen to extend their product range into financial services. Despite denials, Microsoft is rumoured to be developing its own financial products. In addition, the telecommunications company AT&T is now the second largest provider of credit cards in the USA. It was mentioned earlier that the strategy adopted by many US banks has been to establish formal links with technology suppliers in a defensive attempt to retain bank branding on electronic payment products.

CONCLUSION

It is certain that future developments will continue to change the shape of the financial services industry. This chapter has highlighted some of the projects currently under consideration in the industry. The innovations described cover the full range from incremental to radical, many are inter-related and involve collaboration between diverse organisational partners. Possible relationships between the theory of how innovation and technological change are believed to occur and the practical reality were explored during the empirical study, and are developed in later chapters.

Particular care needs to be taken, as noted in Chapter 2, to look beyond the 'hype' surrounding banking innovations, which, as history has shown, may absorb considerable resources over an extended period of time whilst remaining peripheral to more established banking services.

The major issues that have been discussed in this chapter can be summarised as follows:

- The banking industry forms a valid and topical subject of study because of the wide range of competing innovations which now exist at various stages of development (by both established and new players in the market) and also because of the importance of the industry to the UK economy as a whole

- UK banking history shows that early technology strategies which automated existing processes tended to reinforce the culture of stability and control at the expense of innovation

- The availability of new technological opportunities means that banks are facing additional competitive pressures from more innovative industry newcomers

A number of questions arise from these issues which are developed in the empirical study:

- Why has the level of investment in new technology not been translated into significant productivity gains within the banking industry?

- Why does there appear to be little sign of new organisational systems and working practices within the banking industry as a result of a sustained period of investment in new technologies?

- At the macro level, can the future shape of the banking industry be predicted by study of recent technological innovations by established players and new market entrants?

- Does the organisational structure and culture within UK retail banks preclude contemplation of substantive change despite increasing competition and the availability of technological opportunities?

- At the organisational level, can practical guidelines for management be derived by comparing and contrasting the technology strategies espoused by the various players in the financial services market?

Internet addresses of organisations mentioned in this chapter:

http://www.itl.net/barclaysquare/

http://www.sfnb.com

http://www.lloydsbank.co.uk

http://www.mondex.com

CHAPTER 4 - THE RESEARCH METHOD

INTRODUCTION

This chapter outlines the research method that was used to address the questions raised at the end of the last chapter. It begins by describing the problems encountered in obtaining access to banking institutions for interview purposes. The chapter then considers the merits of using case studies in this way, and explains why the approach is particularly suited to financial services research. The chapter goes on to explain how primary data was collated by means of a series of semi-structured interviews with managers and participants in various new technology projects. The organisations studied included both traditional UK retail banks and industry newcomers, which enabled the major issues raised in the literature review to be tested and comparisons made across different project and organisational boundaries. Chapters 2 and 3 examined the changing role of the financial services industry within a UK economy that has been in decline on the world stage for more than a hundred years. This helped to inform and focus the empirical study within a broader context. For example, the organisational conservatism and paternalistic management styles that still appear to prevail in the industry can be understood against the historical background and development of the industry which was described earlier. The questions raised by the review therefore guided the issues that were discussed in the semi-structured interviews.

The chapter goes on to describe how the case study material collected was analysed by the development of 'grounded theory'. This approach is a rigorous method of qualitative data analysis devised by Glaser and Strauss (1967) which uses

comparative analysis of specific cases to synthesise new theories from case study data. By comparing and contrasting the research findings from a number of cases with the results of earlier studies in the banks, it was possible to evaluate the range of possible explanations for the IT productivity paradox. Each alternative theory was assessed in terms of the degree of individual project success or failure that ensued in the various cases. In contrast, and as stated in Chapter 1, earlier studies have tended to focus upon individual examples rather than attempt to evaluate a range of possible explanations for the IT productivity paradox on a comparative basis. It is hoped that this method will lead to a broader understanding of the complex issues involved than has been the case in the past.

Appendices A - D at the end of the study support the material in this chapter by detailing a specimen letter requesting initial interviews (Appendix A) the names and titles of all the interviewees (Appendix B) a sample interview transcript (Appendix C) and an example of grounded theory categorisation (Appendix D).

ACCESS

It was anticipated that there would be problems of access to certain commercial banks for interviewing purposes. Previous research by the author within a commercial bank was hampered by both an ambivalent attitude towards academic research and an insistence on confidentiality. The topic is sensitive in that implementation of certain new technologies could render obsolete the entire structure and knowledge base upon which careers have been built and on which peoples' jobs remain dependent. The very people charged with development often have a vested interest in preservation of the status quo, so great care needed to be taken. Howard

and Sharp (1983) emphasised the importance of obtaining the backing of a reputable academic institution in these circumstances to facilitate access.

The access problem at commercial banks was addressed by utilising personal contacts of the author to gain admittance in the first instance. As recommended by Jankowicz (1993) an assurance of confidentiality was provided in that names of individuals and their institutions would not be quoted, and that the data collected would be stored in a secure place and not used for any other purpose than that specified in advance. It may also be necessary to limit the circulation of the completed research if it is deemed to contain commercially sensitive data, although it is hoped that this strategy would only be deployed as a last resort. Buchanan et al. (1988) recommended cultivation of informal contacts at middle levels of the organisation to form a network of potential sources. In their experience access was facilitated by persistence and avoidance of 'unreasonable' demands upon company time and resources.

THE USE OF CASE STUDIES

A useful starting point is to define what is meant by the expression 'case study'. The following definition is taken from Yin (1984):

> *"A case study is an empirical inquiry that:*
>
> - *investigates a contemporary phenomenon within its real-life context; when*
> - *the boundaries between phenomenon and context are not clearly evident; and*
>
> *in which*
>
> - *multiple sources of evidence are used."*

This approach enables conclusions to be drawn and recommendations made as to future strategies, based upon analysis of both historical and current issues within an organisation. This study draws upon empirical material obtained from established firms and new market entrants in the financial services industry. The material was derived from a review of written records, semi-structured interviews with relevant management, and observation of organisational settings and contexts. This approach allowed a longitudinal feature to be introduced to the research. It utilises the method adopted by Fincham et al (1994) who advocated the use of a sample of case studies in a 'comparative case' method of analysis. They divided case material between an initial set of brief descriptions to familiarise the reader with the firms, and later empirical data categorised by chapters across the themes of the research. The authors found that their approach enabled them to conduct their analysis at three different levels. They obtained a broad coverage of the financial sector, made comparisons between the strategies of individual institutions studied, and also focused upon the specific detail of new technology projects within the organisations. The method gave both depth and breadth to their study, and has also been used to good effect by Zuboff (1988).

It was decided that the development of a series of case studies would be particularly appropriate for this research project because it does not set out to test an established theory. Instead, it aims to establish practical guidelines for the successful management of new technology projects in the financial services sector, by the systematic analysis of project development and implementation in various types of organisation. The issues are complex and require analysis at the levels of project management, organisational strategy and industry sector. As case study material can be gathered from any combination of secondary sources, individual or group

interview, or action research, a number of perspectives can be obtained to inform the analysis.

The stages involved in case study work have been usefully summarised by Bennett (1986) as follows:

- Determining the present situation
- Gathering information about the background to the present situation
- Gathering more specific data to test alternative hypotheses about the important factors in the present situation
- Presenting recommendations for action

The advantage of using case studies in this way is that a comprehensive volume and variety of data can be collected and analysed in comparison with more quantitative research methods. However, the drawback usually cited of the case study method, which involves a relatively small sample size, is in establishing how closely the results can be regarded as representative of the general phenomena under investigation. Bonoma (1985) discussed the need for a trade-off between 'currency', (the extent to which results can be generalised) and 'data integrity', (the accuracy and reliability of results.) He admitted that it was impossible for any one research method to have high levels of both currency and data integrity, but observed that in practice the obsession with data integrity meant that it was often acquired at the expense of useful theories. He claimed that the level of data validity could be improved by a process of triangulation, thereby enhancing the potential for generalisation from a case study. This required the findings from a single case to be corroborated by the use of more than one research method concurrently. He found

that such methods could lead to deeper understandings than more 'scientific' techniques if the research was properly conducted.

Craig-Smith (1990) put forward a persuasive argument for the value of case studies to theory development. He noted that the obsession with applying scientific techniques to management meant emphasis was usually placed upon quantitative research, and the quest for a representative sample resulted in considerable breadth, but relatively little depth. The quantitative approach requires the researcher to stay a step away from the problem in order to be objective, but it is difficult to retain objectivity in a social setting without becoming *too* distant from the problems under investigation. He claimed that application of the scientific method to social problems assumed, perhaps wrongly, that complex issues could be categorised and simplified to make them amenable to statistical analysis. Instead, he advocated the use of a methodology that encompassed observation and description to achieve meaningful results. This approach would certainly encompass the use of case studies and was backed up by Weick (1989) who quoted the following passage from Lindblom (1987):

> *"Theorists often write trivial theories because their process of theory construction is hemmed in by methodological strictures that favour validation rather than usefulness."*

On the other hand, as mentioned earlier, the drawback of the qualitative approach lies in determining the extent to which the findings from a particular case study can be generalised to a wider population. Craig-Smith advocated the careful use of case studies as constituent parts of developing theory, based upon logical rather than statistical inference. He emphasised that logical inference does not imply that the case study in itself is representative of more general behaviour, but that the '*depth of*

analysis conducted is sufficiently plausible' to warrant correlations being made. In other words, while statistical analysis only allows a researcher to infer that characteristics of the sample may be expected in a wider population, conclusions drawn from an informed study based upon a thorough and logical analysis of observed relationships can be equally valid. In the former case, it is possible for evidence of a statistical correlation between two variables to imply the existence of a relationship that does not in fact exist. A more logical analysis would rule out anomalies of this kind. Mitchell (1983) provides a useful summary of the argument to conclude this section:

> *"We infer that the features present in the case study will be related in a wider population not because the case is representative but because our logic is unassailable."*

DATA COLLECTION

Initially a pilot study was conducted among contacts of the researcher at commercial banks, as a 'fact-finding' mission, using open questioning techniques. The early interviews elicited additional information that necessitated a more detailed investigation at the formal interview stage. This took place over a twelve month period so it was possible to cross check key comments by using material from early interviews to inform the later questioning. Table A details the total number of interviews conducted, the role of each respondent within the organisation, and the nature of the specific new technology projects under investigation. The background to each of the case studies is described in the next chapter. An alternative data collection method of participant observation within the organisational setting was initially considered, but rejected because the researcher already has several years'

experience within a commercial bank that can be drawn upon in this regard. Hickson (1986) analysed the value of ethnographic studies to a researcher in comparison with the semi-structured interview technique, and concluded that the information obtained by interview was essentially the same as from participant observation, but *'less cluttered with detail'.*

THE INTERVIEW PROCESS

Watson (1994) noted the need for '*reflexivity*' in interview situations, by which he meant considering the difficulty of remaining neutral and objective within a setting in which the presence of a researcher influences the answers given and attitudes displayed by respondents. As the research methodology was centred upon the development of grounded theory, (described in the next section) a structured interviewing technique in which the precise line of questioning is predetermined was not appropriate, as this method pre-supposes the existence of theories and relationships which can be tested by specific questioning. At the other end of the scale, a totally unstructured interview, in which no guidance at all is given to the respondent, is never possible because the very presence of the researcher and explanation of the project under investigation will influence the thinking and nature of the responses given by the interviewee. Instead, specific primary data was collated by means of formal semi-structured interviews with the industry representatives. Most questions were open ended to allow the interviewees to express their own views fully. Piore (1979) noted the value of anecdotes offered by the respondent in response to such questions, which illustrated the key organisational or environmental influences upon events, and the relationships between these factors.

All of the interviews were tape-recorded and later transcribed, so that a full record of the conversation was obtained. The practice of writing notes during or immediately after an interview was not followed as this tends to partially interpret the data, as only issues that were previously regarded as important will be selected and recorded. Transcriptions can always be returned to and reinterpreted as issues are developed over the period of the research. This method of data collection is well established in the literature, (Easterby-Smith 1991 and Jankowicz 1993) and has been tested by the researcher on a previous occasion, where it was found to be extremely effective in clarifying the often contrasting motives of individual actors. This interaction allowed the literature described in Chapters 2 and 3 to be built upon, and various hypotheses about the nature and extent of the contributory organisational factors to the technological implementation process to be tested. This process contributes to the development of grounded theory, which is described in the next section.

GROUNDED THEORY

Glaser and Strauss (1967) and Burgess (1982) defined the development of grounded theory as the use of *'comparative analysis'* to cultivate theory from data. This method requires the research to be undertaken with no preconceptions of what the findings are likely to be, so that any insights are derived entirely from analysis of data collected. In practice this is difficult to achieve because it is natural for any researcher to draw upon past experience to help understand and explain a new situation. Any intention to retain neutrality and objectivity is undermined by the principle of 'schema theory' (Bartlett, 1932) which holds that it is impossible for the human mind to dismiss preconceptions which impact upon the interpretation of the case under consideration.

Consequently, for the development of grounded theory to be most effective, the qualitative data obtained should be systematically categorised into a coherent framework as particular themes emerge, (see Appendix D for an example). This necessitates the physical separation of sections of transcripts, which can then be categorised and filed under appropriate headings. Each section represents an emerging theme which gains credence the more often the same issue is distilled from different sources. Dominant concepts derived from a series of case studies form the basis of grounded theory. Denzin (1988) criticised the grounded theory approach by warning that the danger of placing too much emphasis upon the categorisation process could lead to *"a corresponding slighting of the actual recording of lived experience in interactional situations"* (p. 432). Care needs to be taken to avoid this problem throughout the data analysis process. It is difficult to predict how many interviews are necessary, but the grounded theory approach suggests that after a number of interviews, a data pattern should emerge, and further data collected eventually becomes predictable. Glaser and Strauss referred to this point as 'saturation', and it indicates that enough cases have by then been studied.

THE PRACTICE OF DATA COLLECTION

The most striking feature of the data collection process was the difference in the quality of data obtained from interviews where the respondent was known to the interviewer, and that which resulted from a direct appeal to the organisation. In the former case, people were often prepared to give more freely of their time, and provided detailed and honest accounts that would have been sanitised or even omitted for a stranger. For example, the case study of Bank A provided considerable detail which has been extensively utilised in different categories throughout the research project. In contrast, the interviews with First Direct yielded less useful data.

The bank prides itself on its customer service record and they were anxious to please, regarding the interviews as a public relations exercise. However, the information obtained was rather bland, and provided little added value over secondary data from press sources. On occasions however, prospective interviews which initially appeared uninspiring turned out to much more valuable than anticipated. In one case, (Bank B) a telephone call I made to one manager was returned by her boss, who had overheard the conversation and offered his assistance as well. It turned out that he had recently completed an MBA course and a research project of his own. After experiencing problems in arranging his own interviews he was keen to help others in a similar position.

When approaching organisations in which I had no personal contacts to follow up, I first of all obtained an initial contact name and spoke to the manager concerned by telephone. The banks get many requests from researchers and tend to direct such enquiries to a Public Relations or Marketing area in the first instance. I found it was useful to emphasise my background and prior employment within the industry to establish a certain amount of credibility. Although often prepared to spend heavily to obtain advice from management consultancies, there are very few - if any - official links in place between the UK banks and the universities which can be drawn upon. In fact I would go so far as to say that the banks do not seem to see any way in academic research could add value to their business despite the turbulent environment in which they are operating. When speaking to the banks I emphasised the aims of the research, and how the final results may well be of practical interest to the banks themselves, but only in one case (Mondex) was this offer taken up. If a manager agreed to be interviewed it was usually justified as a public relations exercise, or on one memorable occasion, *'because you may be my boss one day.'* The telephone conversation was then followed up with a letter of confirmation, which

included a summary of the aims of the project and a list of the general subject areas to be covered. After one interview it was usually possible to speak to other people in the department, or obtain a contact name in a different part of the organisation which could be followed up later on.

Table A shows that the interviewees consisted of marketing managers, industry consultants, project managers and general managers. The level of individual project detail discussed at each interview therefore varied considerably. It was not possible to interview very senior individuals, (at board level for example) and consequently the limitations of the sample in terms of overall 'representativeness' must be acknowledged. In general terms, the interviews can be grouped into two categories, those which focused upon the intricacies of organisation-specific projects and those of much broader scope which examined trends in the industry and compared the IT strategies of various market players.

In addition, 5 interviews have been conducted with banking industry consultants from Price Waterhouse and Ernst and Young. Discussions did not centre upon the detail of particular new technology projects but upon broader issues such as general trends in the industry and the prospects for new market entrants. The data obtained has been incorporated into the analysis and concluding chapters together with the above.

TABLE A: CASE STUDY DETAILS

NAME OF BANK	NUMBER AND ROLE OF INTERVIEWEES	DESCRIPTION OF NEW TECHNOLOGY PROJECT STUDIED
Bank A	1 general manager 2 project managers 1 marketing manager 1 business analyst	Integration of all banking services within one IT network
Bank B	3 marketing managers 2 project managers 1 general manager 6 clerical staff	Establishment of links between European partner banks in preparation for the creation of a European Payment System
Bank C	3 project managers	Integration of worldwide branches within one IT network
Bank D	1 general manager 2 marketing managers 1 business analyst	Development of electronic home banking systems
First Direct	2 marketing managers 5 telephone operators	start up telephone banking operation
Mondex	2 marketing managers 1 general manager	Development of electronic purse product as cash replacement

The objective of interviews falling into the first category was to explore the ideas developed from the literature review in the context of the interviewees' responsibilities for current IT projects at various stages of development. The general trend of the questioning can be summarised as follows:

- What are the recent/current new technology projects under development in the organisation?
- Have problems been experienced in the course of project development and implementation?
- What were the nature of these problems?
- How were they overcome?
- Are any procedures in place to measure the effectiveness of IT projects after their implementation?
- Have changes been made in the management of IT projects as a result of any problems experienced in this case?
- What form should such changes take?

The second set of interviews focused upon more general trends in the industry and the strategies of the major players and newcomers to the market with respect to new technology. The five interviewees were consultants with broad experience of the UK retail banking industry, and well placed to provide an overview of current issues, as well as comment on specific findings from the individual case studies.

THE PRACTICE OF DATA ANALYSIS

As the interview process progressed the focus of the questions became more specific as the categories of grounded theory began to emerge. This did not mean that the interviews became increasingly more useful over time. In fact the process was more adhoc with some early interviews of greater value than later ones. Within this framework, however, it was noticeable that later interviews formed a check on the material covered at an earlier stage. It was also soon apparent that certain issues

recurred time and time again in projects undertaken by different banks, and even in successive projects within one organisation. In some cases the interviews with one bank were spread over a period of several months, so it was possible to return to issues that had been discussed earlier and examine the progress made over time, and also to reinterpret the material covered in the light of later findings from other case studies. The extent of overlap in the emerging categories of grounded theory from bank to bank itself became a significant finding as well as the actual content of the issues raised.

When analysing the interview transcripts it was noticeable at an early stage that different areas of the same bank had their own distinct operating practices, and it would have been far too simplistic to allocate the activities of one individual bank to emerging grounded theory categories. For example, different parts of Bank D exhibited distinct organisational structures and cultures, which were manifested in very different attitudes towards innovation and change within the one organisation. The process of grounded theoretical analysis led directly to the organisation of material within chapter headings. The first - and eventually the largest - category to evolve from analysis of interview transcripts was the influence of structural and functional separation of IT and business areas within the banks on the implementation of new technology projects. The number of facets encompassed within this one heading became rather unwieldy and the data was eventually split into two chapters. The first dealt with the impact of structural divisions within the organisation on the success of new technology projects, and the second with the consequent implications for knowledge creation and transfer. The other categories to emerge from the analysis were the role of leadership and the impact of culture upon the success of new technology projects. Further analysis showed that absence of

organisational learning was a common theme to each of these chapters, and this issue is explored in Chapter 10.

CHAPTER 5 - THE CASE STUDIES

INTRODUCTION

This chapter sets the scene for discussion of the empirical case studies by describing how the banks have integrated information technology into their business over the past forty years, during a prolonged and unprecedented period of investment. The programme has resulted in automation of many traditional banking activities, with the focus now moving towards 'information management' as technological capacity has increased. This provides the necessary broad historical context for informed analysis of specific new technology projects within the retail financial service sector. The chapter goes on to detail the background and objectives of each of the 6 technological change projects under consideration within the case study organisations, together with a description of the difficulties that were faced in practice. The main issues raised by these cases are summarised in the context of the overall objectives of the thesis. The data was obtained from interviews with bank management and industry consultants (as specified in Chapter 4), and also from secondary sources such as literature provided by the banks concerned.

THE IMPORTANCE OF INFORMATION TECHNOLOGY TO THE BANKS

Developments in information technology have provided both opportunities and threats to the traditional providers of financial services. Hardware costs have reduced, and software and telecommunication capabilities have increased dramatically. A historical review by Barras (1990) noted the scale of information

technology investment by the financial services sector. He found that by 1975 the industry accounted for 50 percent of all UK computer mainframe installations, and between 1975 and 1981 the growth rate of total bank system investment approached 20 percent per annum. Since this review the centrality of IT to the operation of the financial service industry has continued to increase, and a recent survey by Morton (1996) found that spending on technology by banks equated to between 20 and 25 percent of total business costs. Curry (1995) emphasised how information technology has developed into a strategic issue for the banks because it is used to increase efficiency, link remote locations, streamline processes and improve customer service. Despite the growing importance of information technology and the large sums of money invested, her research found that technology departments in the banks are still regarded merely as support functions. This finding confirms the assertion made in Chapter 1 that the banking industry constitutes an important example of technological change to study because of its position as the leading investor in new technology. The size of its domination also means that findings from an industry study have a wider relevance in the context of technological change in the economy as a whole.

HISTORICAL DEVELOPMENTS

Mainframe computers were first introduced into banks in the early 1960s to handle statement production, cheque sorting, payroll and other basic accounting functions. The technological emphasis was initially upon the automation of existing tasks, thereby reducing the volume of paperwork and the numbers of staff necessary to process it. As a result, new system design tended to reflect the physical infrastructures that it replaced, and the nature of the underlying roles remained the same. Only later were strategies directed towards improving management

information systems and service quality as memory became cheaper and more extensive. For example, the interbank electronic clearing system (BACS) was introduced in 1971 to improve the productivity of money transmission in an environment where demand for banking transactions was increasing by 8 percent per annum. The Clearing House Automated Payment System (CHAPS) was established in 1984. It allowed payments to be exchanged electronically within one day, and automatically transferred the net surplus or shortfall of payments between the clearing banks at the end of each day. Cashpoint machines (ATMs) first appeared in 1979, permitting 24 hour access to funds. After a slow start they can now be found in such diverse locations as motorway service stations and superstores, as well as in the high street. Initially available for cash withdrawals and balance enquiries, the range of services provided now includes statement ordering, bill payment, travel facilities, and arrangement of interview appointments.

A recent Economist survey of technology in finance (1996) described how the focus of all these expensive systems was upon efficiency of processing rather than analysis of information. Transactions could be handled more quickly and with fewer errors, but as all the banks developed similar systems this ability conferred little competitive advantage. In fact, business such as cheque clearing is now regarded as a utility and increasingly outsourced to specialist firms. Information of value to the banks about the behaviour and needs of their customers was difficult to extract from these process-based systems. For example, data concerning a customer with a current account, mortgage and business account, dealing in stocks, shares and foreign exchange transactions would be duplicated in several different areas of the bank, and none of these areas would necessarily be aware of the existence of the others. The diverse range of systems which have evolved to handle this business were often technically incompatible. It was therefore impossible to assess whether a

particular customer relationship was profitable or could be extended to other products. The development of "middleware" technology in the late 1980s allowed disparate systems to be linked for the first time, facilitating the extraction and analysis of customer data, which could be used to evaluate relationships and improve business decision making. It is only recently that the banks have had the capacity to utilise their technology to its full potential, and it remains to be seen if the process can be effectively managed. The banks will need to make the most of the opportunities presented by this situation if they are to overcome the competitive threat from industry newcomers that was described in Chapter 3.

BANK A - INTEGRATION OF ALL BANKING SERVICES WITHIN ONE INFORMATION TECHNOLOGY NETWORK

This project was a major change programme, initiated in 1992 in response to increasing competition in the financial services industry. The aim was to improve business performance and enable profitability levels to be increased by £200 million within five years. Although the project was centred around IT, it involved and impacted upon every part of the bank as all banking services were to be integrated within one IT network. It was intended that customers would be able to gain electronic access to all of their accounts throughout the country from any terminal, (to transfer funds, arrange a loan, pension or mortgage, for example) without the need for specialist knowledge and functions to be maintained in individual branches. The entire structure and image of the bank was to be altered, removing a traditional emphasis upon geographical splits and making the layout of branches more efficient and welcoming. More than £100 million was invested in the technology required to effect this transformation.

In the course of the change programme, problems began to surface as the bank tried to reconcile planned job losses with a severe skills shortage in the area of new technology development and management, and the often conflicting aims of business and technical personnel. It appeared that staff felt their skills were being devalued, or their jobs put under threat. There was little commitment to the change process and morale suffered. Technically, it was difficult to integrate the new client server technologies (written in SQL Windows) with the mainframe programmes written many years before in COBOL. The mainframe system was also account based and could not be easily changed into a customer-based system. This meant that data concerning customers with more than one account could not be linked together, and this caused administrative problems, duplication of work and low service quality.

The role of some interviewees in this project was to manage a team within the Technology Division that was developing and implementing "middleware" - new technology that enables disparate systems to be integrated. For example, the bank wanted to have a global view of the loan arrears management, and under the old system, customer data would be held in different areas of the bank depending on the particular products involved, and it was a technically difficult and time-consuming job to integrate the data and provide a single figure representing the total outstanding funds owed by an individual customer. Once the systems were upgraded and middleware installed, remote sites across the country could access and assimilate data held in core systems. This work formed part of the bank-wide systems integration objective of the project. The Technology Division expanded rapidly as the project progressed, with staff numbers increasing by over 300% between 1992 and 1994. Many of these newcomers were temporary, employed by consultancies or by the bank as short term contractors, to meet what was perceived as a growing

knowledge gap between the skills of the original staff and the new technological requirements of the project.

Significant difficulties were encountered from a managerial perspective in terms of group morale, as many individuals found their skills to be obsolete and their hitherto secure jobs under threat from the new entrants. These staff had been used to a stable and undemanding environment, looking after an established and well known computer system on behalf of user departments. They now had to acquire new skills as new technologies were introduced and deal with unforeseen problems in interfacing the new systems with the old mainframe, whilst coping with increasing demands and tight deadlines from user departments. In effect, the old working environment and culture was overturned in a short space of time. Uncertainty about the future encouraged rumour, speculation and confusion. In addition, there was no managerial infrastructure in place to co-ordinate each element of the project, which was under the control of different project teams, in line with overall company strategy. As a result, different sub-projects imposed their own procedures and standards. For example, within the same office some groups were working with Microsoft Access version 1 software, and others with version 2, which was fundamentally different in terms of its usage and capacity. As a result of these difficulties, the project began to exceed its budget and timescales. A decision was taken to compromise the original objectives of the programme in order to keep within the allocated schedules. Consequently the radical change programme was abandoned, in favour of a more incremental adjustment. Despite the level of investment made in the project, no attempt was made to analyse and address the reasons for the project failure.

BANK B - EUROPEAN PAYMENT SYSTEM DEVELOPMENTS

The banking industry is regarded by the European Community Commission, (ECC) as central to the concept of a Single European Market, because of its control over domestic and international money transmission and also currency exchange. The ECC is therefore pressing for the creation of a pan-European payment system. This could be formed either by linking existing national electronic systems, or by establishing a single harmonised system, although the latter may imply the creation of a monopolistic public utility. The strategy derives from the ECC's stated policy objective of monetary union, and ratification of the Maastricht Treaty timetabled the introduction of a single currency by 1999. The opening up of Eastern Europe and potential increase in the membership of the European Union, (EU) provides considerable opportunity for the development of electronic payment systems in paper-based societies, as does the prospect of Monetary Union for innovation in cross-border payment mechanisms. The trend towards European integration is increasing the volume and value of cross-border transactions, and technological innovations are widening the scope of payment mechanisms, as described in Chapter 3.

The creation of any new monopoly would appear to contradict standard EC competition policy, which advocates competitive solutions dictated by market forces. Sir Leon Brittan, (1990) in his role as Commissioner for Financial Institutions and Competition Policy, summarised the position as follows:

> *"To achieve the great commercial benefits of a single currency in a single market, we must unlock our payment systems from their current national structures and set them firmly in a European context." (p.54)*

The 'commercial benefits' referred to were quantified in the Cecchini Report (1988) which analysed the potential benefits of a single market to a wide range of industries. It concluded that savings of ECU 22 billion would be generated if a single market were to be established.

A payment system is *"a system of contractual arrangements and operating facilities for transferring value",* (Levitt 1991). It involves communications media by which instructions are transmitted using standard codes, formats and procedures. In traditional payment methods, a clearing mechanism is used to establish mutual positions among the participating bankers and facilitate settlement of obligations by means of a netting system. Within each country an automated clearing house, (ACH) provides this facility and transfer of value is usually made across the accounts that each participant holds with the national central bank. Domestic clearing systems tend to be multilateral in nature, whereas international payments are traditionally settled on a bilateral basis between correspondent, (or agent) banks in the countries concerned. At present, national domestic systems vary considerably. Some countries have sophisticated automated clearing houses, others are basic. The degree of central bank involvement varies between countries, as does the level of revenue they obtain from operating payment systems. (This revenue exceeded $800 million for the Federal Reserve in 1991, a fact which does not encourage innovation and change.) Membership criteria and access to clearing systems also differ across the European Community. For example, in the UK the "club" has only recently been widened to include some building societies, although their powers are severely restricted, (see Chapter 3). There are also practical differences across Europe as regards to the level of industry regulation, operating hours, the length of the clearing cycle, input standards and degree of automation. As a result of these national differences,

transfers across country boundaries tend to be more expensive and lengthy than those made within one country, and the possibility of linking each existing domestic clearing system into one European-wide payment service seems remote in the foreseeable future.

This high degree of diversity displayed in payment systems across Europe appears to be rooted in deep-seated historical differences in social patterns and customs, as well as national legislative structures. It therefore seems highly unlikely that convergence will occur through spontaneous adoption of new technologies and common behaviour. A report by Peeters, (1994) for the Centre for European Policy Studies commented on the situation as follows:

> *"The creation of an integrated European Payment System is likely to be an uphill struggle, requiring substantial systemic changes, a thorough examination and reconsideration of the distribution of tasks and responsibilities between the various players and authorities involved, and discretionary action by authorities and market actors."*
> *(p. 11)*

Gerald Hawkins, General Manager of Payment Services at Lloyds Bank, was not exaggerating in this quote from an interview with The Times (1994):

> *"Cross-border banking is an area and an industry that has been relatively untouched by progress made elsewhere in banking."*

Traditionally, international transfers are exchanged on an individual basis between correspondent banks in the countries of remitter and beneficiary respectively, using

the world-wide electronic inter bank communication system known as SWIFT. The monopolistic nature of this system means that charges are high, and only banks can be members. In many countries it is standard practice for banks to hold incoming payments for 24 hours, (and hence earn interest on the funds) despite the instantaneous nature of the SWIFT transfer system. Multinational banks are also able to transfer payments using their own world-wide network of branches. These services have come under considerable attack in recent years from consumer groups and the banks' business clients with increasing levels of business across Europe. Complaints centre on the slow delivery times, high charges and complexity of a process developed in the Victorian era for settlement of international trade transactions. Since that time, the transfer mechanisms have evolved but the banking procedures involved have changed very little.

Bank B, which forms the subject of this case study, has not yet taken seriously the issue of payment system development in a European context. Although the threat of increased competition from within the banking industry and innovative newcomers is acknowledged, attention has been focused upon consolidation of traditional business in the domestic market. The combination of ECC pressure and media and customer attention forced initial consideration of a European Payment Project in 1991. The original target for project implementation was late 1993, but it was to be another three years before a pilot system was finally in place. The intention was to form alliances with the bank's main European correspondent banks and link computer systems to facilitate the exchange of payments. All non-urgent payments for a particular country would be concentrated upon the favoured partner bank and reduced fees offered to customers utilising the service. The basic payment mechanism using SWIFT was unchanged, although individual transactions destined for one country would be grouped together and sent as one transfer. The

correspondent bank would then split the payment into its constituent parts for transmission to the beneficiaries through the national ACH. The process enables charges to be reduced but delivery times may be significantly increased. Other UK banks followed a similar strategy, and examples of such alliances include National Westminster Bank, Commerzbank of Germany and Societe Generale of France, and also Lloyds Bank, Banco Bilbao Vizcaya of Spain and Credit Agricole of France. This innovation requires only incremental change to existing procedures and makes little use of on-going technological developments. It appears to be unadventurous in comparison with the activities of industry newcomers that are utilising new technology to devise innovative money transmission mechanisms.

The project responsibilities of the interviewees included the integration of business and technical departments of the bank, with the aim of developing an electronic payment system that could interface with the systems of other European banks, providing a compatible international network for exchange of payments. The major problem to hamper their work was the direct conflict between the aims of the project and the maintenance of existing skill sets, career paths and indeed employment itself. All of these features would undoubtedly be threatened by the significant changes in working practices anticipated by any developments in this area. In addition, change directly conflicted with achievement of departmental performance targets, based upon commission taken from the volumes of traditional payments made, and upon which annual bonus payments were dependent. Internal incentives to develop innovative international payment systems were therefore non-existent.

The issues identified by the interviewees that hampered their task can be summarised as follows:

- Ongoing conflicts of interest between the IT department and the business areas
- Resistance to change by staff and management
- Cost controls prohibited consideration of radical changes
- Pressure to economise meant that adaptations to existing technology had to be sought rather than sanction new, more appropriate systems
- Senior management commitment was lacking in view of the adverse impact that a viable solution would have upon existing business levels
- There was no clear international business strategy communicated throughout the organisation
- Links with other European banks were hampered by incompatible systems, and differing organisational goals, procedures and charges
- The overall impression given was that the project was not intended to be completed, but that it existed merely to reassure the European Commission that change was underway

As a result of these problems, progress was slow and by the end of 1997 a pilot system was operating between Bank B and just two of its European Partners. The agreement to exchange payments between the three banks extended only to small items valued at less than the sterling equivalent of £3000, and no formal system links were in place. Instead, the standard SWIFT payment format was maintained, and over 70% of payments were transmitted individually, in the traditional manner. The remainder could be grouped together and transmitted by one message, generating cost savings for the remitting bank, but this advantage was offset when handling incoming bulk payments which had to be split manually into their constituent parts for processing. This was because the payment process was subject to the technical

shortcomings of the SWIFT system, as no agreement has yet been reached on the integration of proprietary bank systems.

BANK C - INTEGRATION OF WORLD-WIDE BRANCHES WITHIN ONE INFORMATION TECHNOLOGY NETWORK

The business focus of the bank at the centre of this case study is the provision of travel facilities and charge cards. Once the market leader in this field, the bank has a world-wide presence and quality image, but this has recently come under increasing pressure from new competitors. The project concerned was called 'Genesis' - it began in 1987 and involved some 500 staff world-wide. It was supposed to combine all of the organisation's separate computer systems used in different countries for the various business functions into one global system. The rationale behind the project was that the state of the art functionality it offered would enable the company to regain its leading market position. Or in the words of one interviewee:

> *"Did anyone ask the customers what they wanted? No, it was merely an attempt to be different, to stand out from the crowd. They were trying to resurrect a historical image, recapture the glory days, but it was over ambitious."* (Project Manager)

The company started to draw up the business requirements in 1987, and by 1991 had concluded that the project would be too massive to handle. No one had anticipated the scale of all the local amendments that would be necessary to meet the requirements of each individual market, legal differences being one pertinent example. Consequently the prospective travel system and card system were thrown

out, and efforts were concentrated upon replacing just the system which controlled the links between the bank and the establishments that accepted the charge card. This compromise was quite different from the initial grandiose plan to replace all existing systems with one global network. The only improvement would be replacement of the current disparate systems in use across the world (that controlled this particular function) with one new system, but this would have little impact upon the business as a whole.

In 1991 a team of business users were drawn from across Europe to see if the scaled down version of the new system would meet differing international business requirements, thereby allowing the work to be integrated properly. At this point the project was already 3 years behind schedule:

- The specific objectives of the project were never elucidated
- No coherent overall project plan and timetable existed
- Games of organisational politics were played at all levels of the organisation
- The project was sabotaged by participants who were afraid to admit failure and prepared to lie about progress
- The organisational structure allowed no individual sufficient power to integrate the systems development and business sections of the project
- The international distribution of the business allowed no individual any jurisdiction over the other countries with interests in the project

- Employees were encouraged to look after their own narrow departmental interests at the expense of the organisation as a whole

- There was friction between system developers and business users

- Departments were reluctant to accept responsibility or take decisions in case they were blamed for possible future project failure

Despite the scale of the project, nobody at a high level seemed prepared to stop the arguments and politics to finally push the project through. Even a mere three months from implementation, (* see note below) different regions of the world were still arguing over whether they wanted it or not. The major costs of the project had been incurred at the development stage, and by now were considered to be historical rather than an incentive to complete. At this late stage, it was nearly decided to cancel the project and upgrade the system used in Australia and extend it to other regions. In the end the project was implemented, but scaled down so much that even within the limited area of the business that remained under consideration, all the features that would have impacted upon customer service were left out. The bare bones of the project were implemented as 'phase one' and all the 'nice to have' features were promised for future upgrades. This meant that from a customer viewpoint, project Genesis offered no improvement in terms of service quality than the system it replaced. It also cost more to run than its predecessor, and provided little added value to the operating staff. This was a somewhat different outcome from its initial conception as the physical manifestation of a grand strategy to regain the leading position that the bank had historically enjoyed in the market. Although the new system merely replaced the existing one in terms of functionality, it was hailed

as a success - and celebrated with champagne - because the actual changeover from the old to the new system was implemented without problems. People were relieved that it actually worked after all the delays and negative publicity. The attention of the operators was fully occupied with learning new routines and screen displays, so adverse comparisons with the original project specification required both the time to reflect and a very long memory.

The major project management weaknesses are analysed in subsequent chapters, but for information purposes can be summarised as follows:

- No attempt was made in advance to quantify the scale and costs of the project and therefore assess its feasibility. As a result, the project lost credibility and morale suffered when its features were regularly downgraded.

- There was no sense of accountability for the money spent on the project, (total expenditure was estimated at £300 million) despite the existence of vigorous controls on expenses and other forms of expenditure which were not related to IT. It appeared that excessive payments could be authorised if the management responsible had no concept of 'reasonable' costs for the expenditure concerned, and would approve the expense rather than admit their ignorance of technical matters.

- There was no coherent long term strategy. Shortly after the project was implemented in Italy it was decided to franchise out that part of the business. The new service provider had its own system and so the Genesis system was taken out of Italy three months after implementation. Similar action is expected in other markets in the near future.

- There appeared to be no evidence of organisational learning, (this was a particularly important finding and is discussed at length in Chapter 10). Subsequent projects were instigated without the implementation of any organisational changes intended to help avoid the problems experienced with Genesis. Business managers with no project management experience had been brought in to run the project, and their accumulated knowledge was lost when they returned to their original role on completion of the project.

- No attempt was made to measure the effectiveness of the completed project in comparison with its original specification. In fact a review was considered but ruled out due to the anticipated cost of one million pounds.

- Creativity was stifled by a 'find the guilty' mentality if any aspect of the project went wrong. Although official policy welcomed innovative ideas from employees, in practice ideas were vetoed if any degree of risk was involved.

- The project leader himself did not have the personal authority to impose the system upon all the regions involved. He was a Senior Vice President who reported to the Head of IT world-wide, who in turn reported to the Chief Executive. This put him only at the same level, but in a different reporting line, from the leaders of the markets in which Genesis was to be implemented.

- The project leader had no experience of managing a large IT project, he relied upon the testimony of his staff who invariably set over-optimistic time scales or glossed over the extent of any difficulties that were experienced, to protect their own positions.

- The separation of technical and business functions ensured that there was no capacity for either the IT division to impose the system on the businesses, or for the business divisions to enforce their particular requirements from the new system. Users were reluctant to admit to their lack of technical knowledge when checking that system specification matched their business requirements, which led to misunderstanding and errors.

* It is interesting to note the emphasis in this project upon 'implementation' as referring only to 'installation' of the system. Writers such as Leonard-Barton (1995) have noted the problems inherent in maintaining such a narrow view of technological change. In particular, she found that consideration of knowledge creation and management were vital aspects of a successful overall implementation process that a focus on merely installing a new system obviously lacked.

BANK D - DEVELOPMENT OF ELECTRONIC HOME BANKING SYSTEMS

Bank D successfully developed a home banking system for use by personal customers and small businesses. PC banking as a service offered by the UK clearing banks is still very much in its infancy, so a brief overview of market trends is provided to introduce this section.

For example, Barclays introduced a home PC service in 1996 that the bank billed as the latest innovative sensation for computer-literate professionals without the time or inclination to queue up in a branch. Hewson (1996) writing in the Times, took a closer look at the package on offer by Barclays and found that it revealed little that was new. Considerable expense and effort was also needed on the part of the customer to utilise the service. It was necessary to have a computer capable of running

Windows 95, a modem, a copy of Microsoft Money 97, and also to pay for the telephone connection charge. In exchange, the customer was able to check balances, transfer money between accounts, pay bills and standing orders. All these services are currently available from telephone banking operations where someone else does the work. The Barclays system allowed customer account information to be transferred into the Microsoft Money personal finance package, but this proprietary communications package worked with no other bank, locking the customer into Barclays at the very time when other new technologies are increasing choice and breaking down such barriers.

Bank D has established a global presence, with offices in over 90 countries world-wide. The sheer size provides a competitive advantage, as significant levels of resource can be devoted to new projects, and inefficiencies or mistakes can be "lost" within complex transfer pricing arrangements. The interviewees all commented on the attitude of complacency towards competitors that still prevails at senior levels of the bank. They described how the organisation remains hierarchical and bureaucratic, with a complex internal structure. Customers can be classified as 'global relationships', 'emerging markets', or 'retail' and there is significant overlap and duplication between these categories. This can mean that a routine customer meeting may in theory be attended by as many as 12 bank management, each with an interest in that particular account, and responsible for a different part of the overall package. There is no pressure to instigate major change because the bank is still making millions while operating within its traditional functions. An exception occurred in 1991 when poor financial results forced consideration of ways to improve efficiency across the organisation. Consequently, information technology functions were centralised within one integral platform. The bank has capitalised upon this over the past five years by investing heavily in state of the art software applications to support its core strengths in trade finance, cash management and foreign exchange services.

One of the bank's London offices which is central to the case study appears to have succeeded in breaking away from the standard company mould. It is responsible for developing and marketing new electronic banking projects to personal customers and small businesses. The strategy is to provide a *'complete solution'* to the business requirements of its clients - this process is also described by management as *'seamless delivery'*. While concentrating upon traditional products, it seeks to customise them to meet individual customer needs. The products offered are of high quality and have a price to match. The business was described by one interviewee as, *'niche banking for a specific type of customer - it is not in any sense a mass market operation.'* Another described the target market and strategy as follows:

> *"Our target market is suited professionals who are high earners, and they are not going to be happy with a smile from a teller, they are looking for innovative products and unless we produce those innovative products they are not going to stay with us. You cannot rely on the inertia of the normal customer in this market... they do not have much loyalty, they will go to whoever offers the newest technology so we have to be on our toes."*
> *(Marketing Manager)*

The office has just gone through a downsizing and reengineering exercise, reducing from 380 to 210 people. The areas of operations, finance and marketing have been overhauled and a new team based structure created with just four levels, namely team member, team leader, director and managing director. This means that the lines of communication are now very short. The new structure is admired by other parts of the bank who regard the London office as the vanguard of new business practices, and aspire to similar achievement for their own areas. To this end, London office management are regularly invited to give presentations around the world to

other parts of the bank, explaining why changes were made and how they were implemented in practice. Despite this communication, attempts to repeat the experiment in other parts of the world have been less successful.

All of the interviewees credited the transformation of the London office to the inspiration of one visionary leader. They commented on how the scope of the changes he introduced extended beyond a mere downsizing operation. By a combination of effective communication and increased accountability allocated to lower levels of the organisation, people began to accept responsibility for activities without adhering to the rigid lines of demarcation which had fragmented their operations prior to the change. The particular new technology project studied was staffed by people with no IT background and experience, but the major communications exercise allowed a successful relationship with the IT department to be developed. The product was an electronic home banking service that linked customers to their account data by means of their own PC. It was implemented in mid 1996 within the original budget and timescales, and has so far attracted a significant volume of new customers to the bank. The interviewees claimed that the timing of the new product launch in 1996 was crucial to its success, because it is only recently that a critical mass of customers have had access to the necessary technology which allows added value to be given to home banking. They believed that earlier home banking systems by other banks had been compromised by the effort required to access them and the unsophisticated nature of the services they offered, (as was the case with the Barclays service described above).

FIRST DIRECT - TELEPHONE BANKING

A report on retail banking trends by Datamonitor (1996) forecasted that the number of regular telephone banking users would triple to 10 million by the end of the century. The report defined 'regular users' as those using a dedicated telephone service for more than 50% of non-cash withdrawal transactions. This figure represents one third of all bank customers in the UK.

First Direct was conceived by a special project 'think tank' at Midland Bank from a clean sheet of paper. The 'Project Raincloud' team was put together during a lean period for Midland in the late 1980s and charged with revitalising the business. At the time, Midland was languishing behind the other clearing banks, which were expanding rapidly in the wake of Big Bang and making record profits in the midst of the 1980s economic boom. The result of the team's deliberations was a remote banking operation that was established in Leeds in 1989. According to a report in The Telegraph by Bates (1996) the other clearing banks were sceptical when First Direct was established, claiming that customers would always prefer to conduct business face to face rather than over the telephone. Now they are all trying to catch up by offering similar services.

Bates noted that while the high street banks argued about the merits of opening an extra hour in the afternoon (from 3.30pm to 4.30pm), First Direct first opened for business at midnight and is open 24 hours a day, every day of the year. An average of 26000 telephone calls are received each day, 52% outside normal banking hours. By acknowledging and acting upon market research which highlighted customer dissatisfaction with the service levels offered by the high street banks, First Direct built up a loyal following by providing quality service at times which were convenient

to its customers. It is also a recent winner of the Sunday Times Outstanding Service Award. Approximately 13,000 new customers are signed up each month, and at one point the bank had to stop advertising as accounts could not be opened quickly enough to satisfy demand. A record was set in February 1996 when a total of 15000 new accounts were opened in just one month. Some 2500 staff are employed on two operating sites in Leeds, and First Direct opened two new sites in Scotland in 1997 to cope with the demand.

Some interviewees attributed the success of First Direct to changing patterns of work and social trends, in which young and busy people in particular are attracted by the convenience of banking by telephone at a time to suit themselves. Others cited the value of the strong support given by the Midland Chief Executive to the project, at a time when the other banks were ridiculing the idea of telephone banking. In addition, the advantage of being the market leader gives First Direct prestige in comparison with 'copy-cat' operations belatedly established by the other clearing banks. As a separate entity from its parent, the new bank was able to develop from scratch a single, centralised customer information system. The system allows any member of staff access to all information about the customer on the line, and to details of the products and services of the bank, without the need for transfer the caller to other departments. The single customer interface is in fact 5 or 6 systems joined together, and the availability of this data is fundamental to the provision of a quality service. IT support is provided by a systems department of 100 people. Although operated separately from Midland Bank, First Direct can still offer customers the use of the Midland branch network to withdraw money, but does not have to bear the expensive operating costs incurred by its parent company. Consequently First Direct benefits from the resources and infrastructure of the Midland branch network but is not tied to the old fashioned computer systems and traditional operations of a large bureaucratic

organisation. It operates in a unique position as both a competitor and a subsidiary to Midland and its parent HongKong Bank.

The culture of First Direct is very open and the management structure flat. All staff, including the Chief Executive Peter Simpson, work in an open area in the same building and are on first name terms. They have devised their own grading structure that is entirely separate from the Midland system and based upon teamwork. Each team consists of 8-12 people under a team leader. One manager looks after several teams, and the only other management layer above this is director level. The teams are organised around shift times so any one customer could deal with any member of any team, depending upon the time of day that they call. Staff are selected on the basis of their communication skills rather than past banking experience, which in fact is sometimes seen as a disadvantage. Many staff are part time or older workers as 24 hour service allows flexibility of working conditions. Each new recruit receives 7 weeks of full time training before answering calls, and training is topped up every 6 months depending on individual needs. Courses available include communication skills as well as specific product training. Calls are often monitored to check staff response in real situations and *'mystery shopper'* calls are also commonly used to test helpfulness. Such is the strength of the service ethic in First Direct that these checks are regarded positively by staff rather than as a threat, as they would be in many traditional organisations. In keeping with the service culture, mistakes are not punished and staff are encouraged to try out new initiatives.

First Direct is not committed solely to the telephone as a delivery mechanism and is currently (mid 1998) investigating the potential of PC banking and Internet links. It does not yet have an Internet presence, and is determined not to compromise its quality image by rushing in to a new market before a first class product is developed.

Surveys have been undertaken of existing customers to establish the likely demand for computer-based banking services. By the very fact of being users of telephone banking, First Direct customers tend to be innovators and receptive to new ideas. Many have professional jobs, are 'technology-literate' and have money to spend. First Direct views this market as its likely source of future competitive advantage, as competitors crowd into telephone banking. It is also considering the viability of extending its customer base by offering business accounts. All of the interviewees were keen to point out that the bank is not complacent about its early success, and is determined to remain one step ahead of the competition by concentrating upon its reputation for innovation and service quality.

MONDEX - ELECTRONIC PURSE REPLACEMENT FOR CASH

Other innovative means of money transfer are now under development in the UK. For example, 'smart cards' (also known as 'electronic purses') look rather like credit cards but have a computer chip built in, which enables them to store more information than a simple magnetic-stripe card. They can be given multi-purpose functions incorporating cash withdrawal, payment at the point of sale, and direct debit to a customer's account. They are also difficult to forge. Physical characteristics of the holder, such as fingerprints, can be incorporated into the card using computer language. It has been estimated that the current (1998) size of the smart card market is 500 million, and this is expected to increase to 2 billion by the end of the century. Smart card technology was pioneered by the French, who have conducted feasibility studies on a large scale and found applications from transport systems to satellite television and public telephones. The introduction of chips into Carte Bancaire payment cards cut card fraud by 75% in the first three years of operation. A number

of organisations, both bank and non-bank, are experimenting with the latest cards, which can also be loaded and reloaded with units of value.

As yet, no common standards exist for either the cards, the authorisation terminals or the machines which reload them with units. Internationally applicable standards for credit and debit card technology, known as EMV, are under development and agreement is promised for 1999. This is necessary for wider acceptance of any smart card initiative as retailers will not be prepared to install a number of terminals to accept different cards, but compromise may prove difficult. Visa International and MasterCard began to work together in 1995 to set a single world-wide identification number standard for smart cards, agree the exact location of the computer chips, and other vital details. Unfortunately, inter-company rivalries soon surfaced to sabotage this co-operative effort, and Visa broke away to set up its own standard in conjunction with Microsoft. Their smart card product was tested amid huge publicity at the Atlanta Olympics, where payment by Visa was the only accepted credit mechanism. Shortly afterwards, MasterCard, IBM and Netscape introduced their own version. Both companies may lose out from this apparently short sighted competitive strategy, as the absence of a single technical standard could well impact adversely upon the commercial viability of any innovative product based upon smart card technology. The chance of a compromise being reached seems unlikely given the historical enmity between some members of the respective groups, notably Microsoft and IBM.

If the use of cards for small transactions in retail outlets becomes widespread, substantial savings in cash handling could be generated by financial institutions. According to a Financial Times survey (1994) there were approximately 300 million smart cards in circulation, and a total of 14 billion transactions made. UK banks

estimated that they spent £2 billion a year on cash distribution, and the equivalent cost to retailers has been estimated at £800 million. The banks also hope to be able to charge customers and retailers for the smart card technology, as the latest estimates of smart card manufacturing cost range from £5 to £20 per card. The initial consideration, however, will be to decide how to convince consumers and retailers of the viability of a world without cash, before attempting to extract payment for using its potential replacement. However, the acceptance of electronic cash requires a leap of faith by the consumer which is not unprecedented. Many financial transactions today are only represented by numbers on bank statements, and at some point in time it became acceptable to receive coins in exchange for goods, then paper cheques instead of coins, and even automatic bank transfers instead of cheques.

In common with the First Direct case, the idea of Mondex was conceived by a special project team within National Westminster Bank in 1990. The team compared the technological features of smart cards with the needs of the financial services market, and came up with the concept of a radical electronic alternative to cash. The idea was immediately patented and the product developed secretly within the bank until 1994 when a separate company was established. The Mondex card looks rather like a credit card but has a computer chip built in, enabling more information to be stored than on a simple magnetic-stripe. It can be given multi-purpose functions incorporating cash withdrawal, payment at the point of sale, transfer from cardholder to cardholder, and direct debit to a customer's account. Mondex can also handle up to five different currencies at any one time, so it forms a suitable mechanism for settling international payments as well as every day domestic transactions. It has a built in security 'chip' that generates a unique signature each time the card is used. Development started in 1990 and Mondex cash cards are currently on trial in Swindon with 13,000 people and 700 high street retailers. The trial participants can

load the Mondex card at a cash point or at home, by inserting it into a specially adapted telephone linked to their bank. There are similar telephones in shops and in street pay phone kiosks, and purchases made are automatically debited from the cards. Mondex differs from other new electronic purses in that value can also be transferred from cardholder to cardholder. The trial will show how comfortable consumers are using electronic wallets instead of cash, and if successful, the product may be launched commercially as early as 1999. The Inland Revenue has already indicated that it intends to accept Mondex for payment of tax and National Insurance contributions. So far however, the trial results have been disappointing in terms of the level of customer interest and number of transactions made, even though the service is currently free and still a novelty to its users.

The majority of the £100 million development costs for Mondex have been incurred in the establishment of a lavish security system to combat the threat of fraud. Funding for the project was provided by Natwest, and its allocation was regarded as a far-sighted decision in the middle of the UK recession. Despite its ownership, the culture within Mondex is more akin to that of a small technology company than a large commercial bank. It operates independently and is therefore totally free of the infrastructure, operations, skills base and values which often appear to constrain the innovative activity of its parent companies. The organisational structure of Mondex UK bears no resemblance to its parent bank. All non-essential services are contracted out, including the human resource functions. Only 70 staff are employed, of which 60% work on product development. The duties of the remainder are split between marketing, legal and commercial security issues. The management structure is flat and employees were recruited entirely from outside Natwest. Many have backgrounds in industries other than financial services. There is no exchange of

staff between Mondex and Natwest, and no attempt has been made to impose banking style grading structures or work procedures on Mondex.

The developers of Mondex have global aspirations for their product, and franchise rights have already been sold to Hong Kong and Shanghai Banking Corporation for use in several Asian countries. Talks are also underway with prospective partners in the US, Europe and Japan. In March 1995 Royal Bank of Scotland announced that it would participate in Mondex. In May 1995 Royal Bank of Canada and Canadian Imperial Bank of Commerce, the two largest Canadian banks, announced that a pilot scheme would begin in 1996 to introduce Mondex to Canada. In July 1995 Wells Fargo Bank in San Francisco began the first Mondex pilot scheme in the USA. In June 1996 Mondex signed up the three largest banks in Australia to form a major new group called Mondex Australia. In July 1996 Mondex co-ordinated each of these initiatives by becoming an independent payments organisation called Mondex International Limited which is owned by 17 major organisations world-wide. Each participant has acquired franchise rights to exploit Mondex in their respective markets. The first Chairman of Mondex International is David Mills, responsible for developing the innovative First Direct telephone banking network. As well as major banking organisations, participants include AT&T and British Telecom.

Discussions in 1993 between Mondex and MasterCard with regard to a possible joint venture broke down at an early stage because of fundamental disagreements over the essential functioning of the product. MasterCard favoured a central clearing and statement-based service, similar to the existing card system, whereas Mondex wanted to have an audit trail on the card itself. This would mean that details of the last 10 transactions were printed out by inserting the card into a special teller machine, and any queries be taken up directly with the supplier. It would also mean

that the transaction costs associated with a central clearing system were avoided. This difference of opinion between Mondex and MasterCard proved insurmountable, and they split up to pursue their own preferred options. The example also illustrates how MasterCard, by thinking within the boundaries of existing organisational infrastructure and functionality, actually constrained the possibilities for innovation in comparison with Mondex. As a new entity with no legacy systems and existing products to influence its judgement, Mondex came up with a new concept in payment systems which was totally independent of existing networks. Despite the advantage held by MasterCard in terms of expertise and market coverage, its preferred clearing mechanism could prove uncompetitive. As with existing credit card systems, retailers would be charged for using the clearing mechanism, and the Internet interface is not yet secure enough to support payment facilities. MasterCard tested its own version of an electronic purse in the marketplace with limited success, and late in 1996 the alliance between the two companies was resurrected with the news that MasterCard International was to acquire a 51% stake in Mondex International for 150 million dollars, (Financial Times, 8th November 1996.) The remaining 49% remains in the hands of the 17 banks which formed the consortium in 1996. Mondex will become an independently-run subsidiary of MasterCard, retaining its existing management team. The agreement allows MasterCard to promote Mondex throughout the 23,000 member institutions that carry its franchise, and it will earn royalties from the use of the pioneering technology developed by Mondex. MasterCard is now committed to using this technology in the 370 million cards that it currently has in circulation throughout the world.

The credibility of Mondex has received an enormous boost from the MasterCard endorsement. The access to established distribution channels, a leading brand name and global customer base should ensure that the necessary critical mass of customer

support can be built up. Each interviewee acknowledged that the major challenge they faced was to build an entire company around a new and untried product. The alliances made to date have succeeded in raising the profile of the Mondex concept world-wide but the most difficult hurdle - that of widespread public acceptance - remains to be faced when the project finally goes live.

CONCLUSION

This chapter has introduced the 6 empirical cases, and placed the specific projects studied in the broader industry context by describing how the banks have come to rely upon information technologies over the past 40 years as their operating environment has become increasingly competitive. The remaining chapters deal with analysis of the issues raised in the cases to address the central question of this thesis - why the massive investment by UK banks in information technology is not being translated into significant productivity gains.

CHAPTER 6 - ORGANISATIONAL STRUCTURES FOR INFORMATION TECHNOLOGY

INTRODUCTION

This chapter analyses the impact of organisational structures for information technology upon the success of the technology projects undertaken by the six case study banks. It begins by introducing relevant theories concerning the role played by organisational structure in the technological change process, before incorporating the main findings of the empirical study. This material was derived from grounded theoretical analysis of interview transcripts together with secondary data supplied by the case study organisations. The findings of earlier published research in the financial services industry are also included to support the conclusions that are drawn from the empirical study. The most dominant category to emerge from grounded theoretical analysis of interview transcripts was initially entitled 'structural and functional separation of IT and business areas.' This file soon became unmanageable in size as the issue featured prominently in each of the case studies. Consequently the subject has been divided into consideration of structural issues at the organisational level and expertise issues at the individual level. The first category is dealt with in this chapter, and the second in Chapter 7. This chapter contributes to our understanding of the productivity paradox by concluding that the most successful change projects studied tended to be separated from mainstream organisational activities to avoid the restrictions imposed by traditional structures. While this policy paid dividends for the projects in question, such isolation did little to stimulate a climate of innovation throughout the organisation.

THEORIES OF ORGANISATIONAL STRUCTURE

The classic work of Burns and Stalker (1961) was drawn upon in Chapter 3 when describing the hierarchical and bureaucratic structure of the banks that has become firmly established over time. It was suggested that this form of organisation was indicative of a 'mechanistic' structure best suited to stable operating conditions. In contrast, Burns and Stalker labelled organisational structures that relied upon a looser network of control, knowledge and communication as 'organic', and more suited to less stable environments. Such features encouraged collaboration and commitment to problem solving throughout the organisation. In their words:

> *"The organic form is appropriate to changing conditions, which give rise constantly to fresh problems and unforeseen requirements for action which cannot be broken down or distributed automatically arising from the functional roles defined within a hierarchic structure."* (p.121)

Scarbrough and Corbett (1992) drew upon this work when noting the appropriateness of organic organisational structures in the context of the technological innovation necessary within a changing environment. They showed how such structures supported innovation by allowing knowledge and information to transcend the constraints of the artificial functional boundaries and rigid hierarchies of responsibility that typify the mechanistic form. However, to suggest that an organisation needs merely to change from a 'mechanistic' to an 'organic' structure in order to demonstrate adaptability in the face of changing environmental conditions is a major undertaking in practice. Whipp and Clark (1986) studied an attempt by the car manufacturer Rover to transform its structure in response to increasing competition. The results were disastrous because both the resilience of the

established structure and the extent of change necessary were grossly underestimated:

> *"The grasping of new opportunities means that the existing body of corporate knowledge has to be 'creatively destroyed' and constructively replaced." (p.213)*

Indeed, Burns and Stalker themselves doubted whether a mechanistic firm could transform itself into an organic one in response to changing environmental conditions. They noted how 'pathological' systems tended to develop when a mechanistic organisation tried to cope with innovation and change whilst retaining its traditional bureaucratic structure. These new systems resulted from destructive power struggles as individuals wrestled with unprecedented levels of uncertainty. The issue of changing from mechanistic to organic structures in response to increasing competition is particularly relevant to the case study banks, and will be returned to in the concluding chapter which discusses the need for organisational learning to occur if technological change opportunities are to be maximised.

STRUCTURAL RIGIDITY WITHIN THE UK BANKING INDUSTRY

It was noted in the introductory chapter that information technology does not yet appear to have 'transformed' business practice in the manner we have been promised in the media. For example, a comprehensive study of innovative projects and expertise in the financial services industry by Fincham et al (1994) found that the traditional structure, functions and priorities within the banking industry remained largely unaltered, despite the opportunities presented by technological developments. Their research programme concentrated upon a series of case

studies that examined the managerial problems experienced within organisations when handling new and diverging knowledge bases. The projects studied included branch automation systems, MIS, customer cash management systems, telebanking, customer care databases and credit card processing packages. The authors observed little sign of structural transformation, despite a decade of deregulation and intense competition. They noted how new skills in marketing have been gradually integrated without disrupting the traditional and prevailing knowledge base of the industry. For example, the need for a more 'customer-friendly' image was belatedly recognised, but the changes made tended to be cosmetic, (such as the introduction of new open plan branch layouts that were supposed to be more welcoming) and the underlying business principles remained unaltered. The same banks continue to dominate the UK industry, and some of these are now retreating from their rapid expansion into new markets during the 1980s. Instead they are now focusing intently on their core business, and relying upon takeovers or mergers to stimulate change:

> *"Expansive growth and the speeding-up of product lifecycles had stimulated technological innovation and seemed to demand the multi-functional integration of roles in product development and delivery. Deregulation and market dynamism called existing institutional orientations and management models into question. But growth tended to be managed through diversification or organically rather than by restructuring." (p. 299)*

This conclusion is supported by more recent developments in the industry. For example, Lloyds Bank has sold many of its foreign branches and its merchant banking subsidiary in the past few years, and concentrated resources upon its traditional strengths in the domestic market by taking over TSB and Cheltenham and Gloucester Building Society. The resilience of organisational structure is also

illustrated by the continuity of the fundamental activities of Midland Bank in the UK, eight years after its acquisition by HongKong Bank, one of the largest banks in the world.

Many studies of technological change in the banking industry have noted how specific projects have been compromised by a tendency to adhere to increasingly old fashioned and inappropriate organisational structures, in the manner of the findings of Burns and Stalker that were described earlier in this chapter. Research by Howells and Hine (1994) into the development of EFTPOS technology found that the establishment of a national network of banks and retailers was sabotaged by the differing agendas of the various actors involved, each operating within rigid hierarchical structures. The major problems in this case concerned the rigid separation of technical and commercial functions within the banks, and the existence of many hierarchical layers of management which separated those individuals with the power to take strategic decisions from those working on the project itself. The end result was a series of bilateral arrangements between individual banks and retailers, rather than the creation of one national network, and the cost of the project was estimated to exceed £120 million.

Research in the commercial banking sector by Child and Loveridge (1990) uncovered little evidence of structural change in banking organisations following the introduction of new technology, with clear historical hierarchies of status levels and technological legacies rigorously maintained. They found that the major influences upon banks' technology policies were the *'national banking habit'* and the historical development of the institution under consideration within society. These factors had led to the establishment of deeply embedded skill sets, grading hierarchies, structural segmentations and power positions during the long period of stability in the industry.

The researchers concluded that the potential of new technology was compromised by adapting it to fit in with the prevailing organisational conditions and priorities.

Scarbrough and Lannon (1988) also noted the response of many banks to the changing technological environment tended to be ineffective because of inappropriate organisation structures, and that the existence of specialised, segregated functions developed to manage existing technology often acted as barriers to change. As a result, even considerable investments in technology produced disappointing levels of return in strategic terms. Specifically, the authors described how Bank of Scotland had lost significant market share as a result of a disastrous policy towards ATM introduction in the late 1970s. The bank then reviewed its technology policy and recognised the need to change its traditional organisational structure, thereby creating a more flexible environment that was better placed to respond to rapid technological developments. This process involved:

> *"...overcoming the major barrier of differing departmental interests and perceptions, where each department is unable to see the problem other than in its own narrowly defined terms." (p.253)*

The transformation was facilitated by the appointment of a young, dynamic General Manager who supported champions of innovation within the bank, and integrated technology policy into mainstream activities. This stimulated awareness of the long-term implications of new technology on banking operations. Within a climate of informality that encouraged personal initiative, barriers to organisational learning were overcome. HOBS (Home and Office Banking System) was launched in 1985, many years ahead of the competition. The authors described how Bank of Scotland came to be regarded as a market leader in its utilisation of new technology, as the

major restructuring exercise enabled a more viable approach to the management of innovation to be developed.

ORGANISATIONAL STRUCTURE FOR IT IN THE CASE STUDY BANKS

Bank A has a separate IT division and, until recently, three senior IT managers controlled their own areas within the division. They initially reported to the Finance Director of the bank. During the project to integrate all banking services within one IT network which forms the subject of this case study, a new manager was recruited over the heads of existing IT management to act as liaison between IT and the Finance Director. One interviewee described the results of this decision as follows:

> *"The Finance Director used to have a good involvement, he has an IT background and got things done through the three IT managers reporting to him. But then they brought in a new manager - as a sort of buffer. That's all she does, nothing goes up and nothing goes down... who knows why she's there? Nothing has been delivered since she arrived." (Project Manager)*

This decision ran against current trends within the industry that aim to improve levels of efficiency by removing layers of management. The new IT manager had no IT background, but came with a reputation as *'an effective manager'*. Her appointment meant that five layers of management now came between the programming staff at the bottom of the hierarchy and the Finance Director at the top. At the same time, in other parts of the IT division, team leaders and project managers were made redundant, effectively removing two management layers in these areas. No consensus therefore existed on the best way to structure the division as a whole.

Until 1995, Bank B maintained a bank-wide area known as 'Group IT'. It employed 3500 people whose sole function was to provide IT services to other areas of the bank. In addition, specialist IT sections had evolved within the operating areas to meet local needs, so there was considerable duplication of resources throughout the organisation. In recognition of this problem, Group IT has now been split up into 6 different divisions, one for each operating arm of the bank. This means there is no longer a single IT Director for the bank as a whole, but 6 Heads of IT who report to the Director of their respective divisions. One interviewee commented on the situation as follows:

> *"It is too early to say whether this structural change will be successful...it should mean that the relevant part of IT is fully in tune with what its operating area wants. The downside is that I do not know what level of co-ordination there will be in IT across the bank - if for example the insurance arm and the retail arm use different systems and do not talk to each other....maybe there will be some overarching layer of management to co-ordinate and ensure standards are applied throughout the bank - but I'm sure someone on high is paid to think about these things."* (Project Manager)

Bank B has retained one bank-wide systems area that has a watching brief for the whole bank in terms of looking at new technologies that may be of future benefit to the organisation. If a particular idea is considered viable, then a business sponsor is sought for it from an area of the bank that would benefit from the technology. The activities of this small area (20 staff) are centrally funded, and their recent initiatives include 'kiosk' banking facilities, and the automated delivery of loans through cashpoint machines. The team is separated entirely from the operating divisions of the bank and its role as a 'think tank' for identifying industry trends is endorsed and

closely monitored by the Chief Executive. The original ideas for Mondex and First Direct came from similar project teams within high street banks, but Bank B is one of the most conservative institutions and therefore seems unlikely to consider developing anything as radical as a new form of bank.

Bank C operates as a very hierarchical organisation, with many layers of management. The head of the world-wide office integration project which formed the subject of the case study was a Senior Vice President who reported to the Head of IT world-wide, who in turn reported to the Chief Executive of the bank. The project head occupied the same level of management as the leaders of the branches that the project was attempting to integrate, albeit in a different reporting line. This meant that he did not have the power to enforce project co-operation and commitment from all interested parties. He also lacked IT experience having been seconded from a business area to run the project in question.

The interviewees working for Bank D described how the organisation as a whole remains hierarchical and bureaucratic, with a complex internal structure. They believed there was no pressure to instigate major change because the bank is still making millions while operating within its traditional functions. An exception occurred in 1991 when poor financial results forced consideration of ways to improve efficiency across the organisation. Consequently, information technology functions were centralised within one integral platform, and the London office that forms the subject of the case study has just gone through its own downsizing and reengineering exercise. The areas of operations, finance and marketing have been overhauled and a new team based structure created. There are just four levels in total, namely team member, team leader, director and managing director. This means that the lines of communication are now very short. The Managing Director was previously the IT

Director and this has ensured that a focus is maintained on new technology developments. The new structure is admired by other parts of the bank, who regard the London office as the vanguard of new business practices in comparison with their own areas, which are still locked into bureaucratic hierarchies.

The management structure of First Direct consists only of three layers. All staff, including telephone operators, systems, and the Chief Executive Peter Simpson, work in an open area in the same building and are on first name terms. The bank has devised its own grading structure based upon teamwork which is entirely separate from the Midland system. Each team consists of 8-12 people under a team leader, and one manager looks after several teams. Out of a total of some 2500 employees, 100 IT staff support the single customer interface which is in fact six systems joined together. The availability of this data is fundamental to the provision of a quality service. In practice, when dealing with a customer on the telephone, the operator has immediate access to all relevant information about that customer, regardless of the subject of the enquiry. This means that customers do not have to be passed from department to department if they make use of a number of bank services.

As an independently run subsidiary of Midland Bank, First Direct was able to develop the technology necessary to provide this service from scratch. This meant it was not reliant on adapting existing Midland 'legacy' systems to develop its new service. Chapter 3 described the problems associated with updating and linking the diverse computer systems that have evolved in the banks over many years. These systems are often put together in a piecemeal fashion and have to be maintained and operated to support day-to-day banking activities. Customer data in particular tends to be scattered between the computer systems of different functional areas that

cannot always communicate to utilise the data effectively. Consequently the banks often have no means of forming an overall picture of profitability or activity by customer. As a separate entity from its parent bank, First Direct has been able to adopt a 'clean sheet' approach to system building and data management. Each interviewee identified First Direct's ability to customise its information technology to suit specific business needs as pivotal in establishing the new bank as a provider of quality service. In addition, First Direct offers customers the facilities of the Midland national branch network to withdraw cash or pay in cheques by linking the infrastructure of its proprietary computer system to that of its parent.

Mondex was initially run as a secret project within Natwest until the company was formally established in 1994. The Mondex management team is totally 'ring fenced' from the normal business activities of Natwest in a similar manner to First Direct's separation from Midland. The organisational structure within Mondex UK bears no resemblance to its parent bank. All non-essential services are contracted out, including the human resource functions. Only 70 staff are employed, of which 40 work on product development. The duties of the remainder are split between marketing, legal and commercial security issues. There are just four levels of management in total and all employees were recruited from outside Natwest. Many have backgrounds in industries other than financial services. There is no exchange of staff between Mondex and Natwest, and no attempt has been made to impose banking style grading structures or work procedures on Mondex.

This section has highlighted the advantages which accrued to First Direct and Mondex in respect of their separation from the massive computer systems, established organisational hierarchies and pools of expertise which have evolved in their parent companies. One interviewee commented that some US banks have

taken this scenario further and are starting to operate 'parallel banks.' These are effectively new outlets starting with a clean sheet - that is, new technology and new staff - for the benefit of customers who expect 'state-of-the-art' banking facilities. The banks concerned run both their traditional and their new operations along side each other, rather than attempt to convert legacy systems - which are still adequate for certain segments of their customer base - and retrain existing staff to operate effectively in an entirely different culture and business environment. As this strategy is still very new, it remains to be seen how successful (and indeed expensive) it will prove to be in practice.

Although all the interviewees at First Direct and Mondex were keen to point out how independent they were from their parent companies, and how crucial this policy had proved to be in their success, there is a sense in which they can still be regarded as very dependent upon their founders. First Direct relies upon Midland Bank for access to the clearing system, and its customers use both the branch and ATM networks extensively. Mondex has grown by forging links with traditional financial institutions world-wide, which now own shares in the company. This strategy culminated in the takeover by Mastercard that now owns 51% of Mondex. Whilst both projects have benefited from independence on an operational basis, structurally they are still tied to their founders. As a further example, the innovative insurance company Direct Line obtained regulatory approval only because of its backing by Royal Bank of Scotland, and has benefited from the bank's financial support in the early days, as well as obtaining access to its large customer base.

There appears to be little consensus among the case study banks with respect to the best location of the IT function within the organisation. Some of the banks had centralised their IT, others had done the opposite and split the role between different

parts of the bank. The most significant issue to arise from this analysis of IT structures is the apparent reluctance of the banks to change their existing organisational configurations. This conclusion supports the findings of earlier research in the industry by Child and Loveridge (1990), who summarised their work as follows:

> *"...learning to secure the full potential of a new technology is a process that is shaped and bounded by forces of a social and political nature in the sense that the people who are involved have a concern to preserve or extend organisational relationships with which they are comfortable. They are likely to contest alternatives using the power and influence at their disposal." (p.359)*

In the cases where current systems are clearly inappropriate to support their new developments, the banks have gone to considerable expense to maintain existing structures, while at the same time setting up entirely new systems to facilitate their entry into new markets. This finding supports the work of Burns and Stalker that was described earlier - they believed that the very nature and characteristics of mechanistic organisations mitigated against contemplation of radical change.

INTERACTION BETWEEN BUSINESS AND IT AREAS

This section takes the issue of organisational structure to the individual project level by examining the working relationships between the systems and business areas of the case study banks, and it considers how the level of interaction influenced the success of the technology projects in which they were involved.

Child and Loveridge (1990) noted the impact on new technology projects of a lack of communication between decision makers and system operators:

> *"The greatest single barrier to effective learning in this most vital of developments for our future lies in the organisational inhibitions that prevent the free interchange of views from all who have something to offer." (p.382)*

Their study found that system development groups considered to have 'expert' knowledge were separated both geographically and structurally from the prospective users of the technology. In addition, the system operators at low levels of the organisation were not consulted about technological change issues and had no input to decision-making. Their expertise was therefore not utilised or indeed valued by senior management.

Similar results were obtained in a study of the financial services industry by Currie (1995). She noted the extent of the gulf between systems and business staff, which led to power struggles, rigid demarcations and the development of separate languages and working practices. In one of her cases, technical staff felt that the major criterion for project success was to align the business and system specifications, and then devote the best brains to system development. On the other hand, business managers preferred to concentrate upon delivery within budgets and time scales, thereby allowing quality adjustments to be made at a later date. The IT staff also believed project failure could usually be attributed to the lack of technical knowledge on the part of business managers, who in turn believed technical staff lacked the managerial skills to run a project. They were stereotyped as '*techies*' or *'pointy-heads'* and regarded as poor communicators. The author argued that new

technology projects would be more likely to succeed if these entrenched perceptions could be overcome.

Similar problems were noted within the case study banks. As described earlier, the leader of the branch integration project at Bank C did not have the seniority to enforce its implementation. One of the interviewees described how this problem was exacerbated by rigid divisions between systems and business areas:

> *"The IT people were completely separate from the business people, and never on the same wavelength. The person in overall charge of the project did not have the authority to make any system decisions, he had to go to his colleague on the systems side. When I was working on this project I had to go to the systems people and ask on bended knee if they would do certain things. If it was a legal requirement they had to do it, but if it was a business requirement I had to justify it in blood."* (Business Manager)

Tension between business and IT areas was also reported by an interviewee from Bank A:

> *"The project had a business project sponsor that knew a lot about IT... in fact the biggest problem was that he probably knew more than the IT manager. He would have made a good IT manager and he knew it. This caused such a poor working relationship that the IT department deliberately held up the project just to spite him. They favoured people who were not so bolshy and did not try to tell them how to do their jobs."* (Business Analyst)

Another interviewee from Bank A endorsed this view and described how there was no attempt to integrate the needs of the business and the capabilities of the system during the project:

> *"The first time that input from the users was obtained was after the project was delivered. There was a good integration between the programmers and the business managers, they worked in the same office, and socialised together. The IT management did not get on with the main business sponsor, and they did not like their staff bypassing them in this way. They tried to prevent the programmers from talking to the business managers without going through the IT managers first. They had to justify their own role and were jealous of a rapport between their subordinates and 'the enemy', as it were."* (Project Manager)

Both interviewees attributed the major reason for project failure at Bank A to lack of communication between business and user departments at a managerial level, and also to a lack of appreciation of changing roles and priorities in an increasingly competitive market. Historically, IT was used to dictating terms to the business for systems design and implementation, relying upon what a Marketing Manager termed *'a certain technical mystique'* to get their own way. As business users became more IT literate, they regarded the systems area as just another supplier, and became far more demanding.

Keen (1991) surveyed a range of articles from the 1970s and 1980s which showed that the gulf between business and IT areas is nothing new, and indeed the issue has dominated management concerns for many years. He noted how the same

explanations are repeated again and again with little progress made over time in addressing the issues:

> *"These old complaints are boring and their repetition does little to move the organisation ahead. Yes, the IS organization has far too often not delivered on its promises. Yes, technical people too often do not understand business. Yes, users too often do not know what they really want...So what? Instead of dwelling on the old concerns, why not accept their historical validity and work on opening the needed dialogues that will end them?"* (p.215)

Again, this finding demonstrates a reluctance to learn from past mistakes as the same problems recur from project to project over an extended period of time. This issue will be returned to in Chapter 10 which discusses the need for organisational learning.

Examples were found among the case study banks of efforts to address the gulf between business and IT areas. One of the Management Consultants interviewed described how he had noticed an increasing tendency for banks to reconcile divisions between their business and IT areas by undertaking a "business alignment programme." This process involved analysis of the fit between the core businesses of the banks and the systems necessary to support this business. To get all the necessary staff working more closely together, people were physically removed from their roles within operating areas and given permanent roles as liaison officers in the IT area, while IT staff were transferred to fulfil similar roles in the relevant operating areas. The interviewee described the aim of this strategy as follows:

> *"The aim is to co-ordinate the two areas so that IT can facilitate operational enhancements. It also means that common sources of friction between the two roles can be avoided. For example, a business area may be convinced of the merits of a new technology, and then expects the IT department to integrate it smoothly into existing systems with which it was not designed to interface. Generally what IT people hate is having to implement yet another database because the operations people say, 'this is the best product - just do it'."* (Industry Consultant)

These issues are developed further in Chapter 7 under the sub-heading 'Hybrid Managers'.

There was little evidence of formal strategies like this to integrate IT and business areas within the case study banks. Bank A attempted to resolve the gulf between systems and business areas by setting up a steering committee. This committee met once a month and reviewed actual progress against a timetable drawn up at the start of the project. It was run by senior management from the business and IT. Selected project participants were invited to present progress reports. Slippage from the original timetable meant that the chosen project representative was given a hard time at the meeting, but no action was taken to address the issues raised, or to amend time scales in the light of circumstances which had arisen during implementation. One interviewee described how care needed to be taken when reporting to the committee:

> *"It is a grilling really - 'why have you not delivered?' And of course you cannot tell them the real reasons, they may be sat right there in front of you. It's easier to be upbeat about your progress, or to claim that certain issues are*

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> *"It is a grilling really - 'why have you not delivered?' And of course you cannot tell them the real reasons, they may be sat right there in front of you. It's easier to be upbeat about your progress, or to claim that certain issues are*

> *now resolved, or to blame another department... because next time it's someone else's turn to be hauled up there."* (Business Analyst)

On a more positive note, an interviewee from Bank D described how the success of the electronic home banking project could be attributed to the close working relationship which was built up between the business and IT areas:

> *"Banking staff with no systems experience were seconded to the project, and it was successful. There was a date to meet and we did it. Everybody was involved and consulted from the start - IT were not allowed to dictate what was done. This vision of involving everyone came from the MD,* (ex IT director) *previously IT would have just gone ahead and ground level staff would not have been involved even in the testing. All business areas are now much more closely involved with IT than they ever were... so you do not have the IT area here and the business area there, we have collective responsibility for system development. The lines of demarcation have become increasingly blurred and everybody owned that project. Any new technology that comes along, we can now go for it"* (Business Analyst)

In this case, all of the interviewees gave the credit for encouraging the business and IT areas to work together to the Managing Director. He had an IT background and could empathise with the problems of both sides, as well as having the power to enforce somewhat radical ideas. One interviewee confirmed the validity of the above project success criteria with this comment:

> *"Success comes down to user involvement in design. You need key involvement from the best people in the department, who are really committed*

to it because it will solve their problems. For once we had this, and the whole thing worked...it was easy really." (Project Manager)

CONCLUSION

One of the dominant themes to emerge from grounded theoretical analysis of the data was the influence of organisational structure upon the progression of IT projects. Consequently this chapter has focused upon the role of organisational structure for information technology within the case study banks. Data analysis therefore suggests that the issue of restrictive organisational structures may contribute to our understanding of the IT productivity paradox by building upon existing theories which were detailed in Chapter 2.

In this chapter, the value of separating innovative projects from mainstream operational activities has been made clear, but at the same time the continued reliance of such projects upon the parent institution has also been noted. In the examples studied, it seems that the benefits of the organisational separation policy are restricted only to the particular project in question. This is because day-to-day activities within the bank are unaffected, and therefore no ongoing commitment to innovation is generated in the organisation as a whole. The resilience of traditional structures within the banks supports the contention of Burns and Stalker made many years ago, that mechanistic organisations have great difficulty transforming themselves into organic ones in response to competitive pressures. This study therefore builds upon the work of Burns and Stalker by focusing upon the transition period between mechanistic and organic structures that is not emphasised in their work.

A sub-category of grounded theoretical analysis of organisational structure concerned the level of interaction between business and IT departments in the context of project success or failure, which has also been examined in this chapter. While interviewees from both Bank A and Bank C cited poor communication between the two areas as a major contributor to project failure, the successful project run by Bank D was characterised by a close relationship between all project participants. The next chapter continues this theme by considering in more detail how the case study banks dealt with the issues surrounding business and technical expertise at the individual level.

CHAPTER 7 - KNOWLEDGE MANAGEMENT

INTRODUCTION

This chapter begins by discussing the issue of knowledge and reviewing relevant literature on the subject of knowledge management. It then analyses how the banks managed the changing knowledge requirements during implementation of the new technology projects that were studied. The difficulties of changing skills which have become entrenched within the organisation over time are considered, and the attitudes of both business and IT staff towards change are compared. Attempts made by the banks to manage the knowledge acquisition process in terms of recruitment and training policies, manipulation of internal grading structures, and the development of 'hybrid' managers are then reviewed. From analysis of both the literature and the empirical examples, the chapter concludes that project success can be facilitated by the adoption of deliberate policies to cultivate new skills and develop a more flexible and IT-literate workforce. These findings therefore contribute towards both our understanding of the productivity paradox and how the problem may be addressed in practical terms.

KNOWLEDGE MANAGEMENT

One of the first writers to emphasise the importance of knowledge management was Peter Drucker who coined the phrase 'knowledge worker' in the 1960s. Drucker (1993) built upon his early work by suggesting that an organisation needed to shed obsolete knowledge, and sustain existing knowledge, while simultaneously creating new knowledge on a continual basis if it was to remain viable. These ideas are

supported in a famous work from the Japanese perspective by Nonaka and Takeuchi (1995) who noted the need for organisations to *'acquire, create, accumulate and exploit the knowledge domain'* if they were to succeed. The authors argued that innovative firms display characteristic mechanisms which enable them to manage knowledge effectively. The central feature is the ability to create synergy by combining 'tacit' and 'explicit' forms of knowledge. This means that both intuitive and analytical approaches to knowledge management are regarded as complimentary rather than contradictory, and can therefore feed off each other in a positive manner.

The management of knowledge has been brought into sharper focus in recent years because of fears over the possible impact throughout the economy of what has become known as the 'year 2000 problem'. In addition, there is the possibility of conversion to the Euro at roughly the same time. These imperatives have precipitated a massive demand for IT skills in many industry sectors, as companies (often belatedly) begin to grapple with the unknown. Skills once thought redundant are now back in fashion as ageing computer systems with programmes written many years ago in, for example, COBOL and BASIC languages now have to be made 'millenium compliant'. Staff are being brought back from retirement and can often name their price if they possess the technical skills necessary to address these issues.

Houlder (1997) noted how companies are beginning to recognise the importance of ongoing knowledge management to avoid this type of crisis, and she observed an increasing number of 'knowledge managers' within organisations who are taking on responsibility for managing knowledge. The aim of this focus upon knowledge is to create and disseminate the expertise of employees throughout an organisation in order to stimulate innovation and facilitate organisational change. To a significant

degree it has been prompted by the problems involved in integrating computer systems and streamlining information flows around an organisation. In practice, Houlder found that people are often reluctant to cooperate with initiatives which encourage them to share their knowledge, because of the perceived threat to their status as experts, which is based upon the possession of knowledge that others lack. This finding is supported by Scarbrough and Corbett (1992) who noted that hierarchical organisational structures are not conducive to the sharing of knowledge. They quote examples of social divisions between 'management' and 'workers' which prevent meaningful communication, despite the high levels of detailed knowledge that can be acquired over time spent working on the shop floor. Management often saw initiatives by workers to improve their effectiveness as a threat to their own positions:

> *'The emphasis on authority and control is antithetical to the generation of knowledge commitments. The latter can only emerge where groups and individuals can freely communicate, relate to and act upon the knowledge that they develop.'* (p. 132)

The difficulties of sharing knowledge throughout an organisation are compounded when new types of knowledge are required. As Fincham et al (1994) found in their study of financial services, the application of new technologies inevitably leads to changes in the content and distribution of knowledge. They highlighted the differing types of knowledge which, although very different from each other, are often grouped together in discussions of knowledge management. They distinguish *'formal'* knowledge, which is usually available in written form such as a manual, from *'informal'* knowledge. The latter is specific to a particular job or working group and is acquired from colleagues over a period of time spent 'on the job'. The authors also

noted the importance of *'contingent'* (or *'local'*) knowledge acquired from working within the broader organisational environment, and especially '*tacit'* knowledge which is difficult to specify and can only be acquired by experience and following the example set by others. Finally, they specified '*cultural'* knowledge that encompasses organisational rituals and values and is altogether broader in scope than a mere application of particular procedures. In the past, the authors showed that banks have concentrated upon formal forms of knowledge by relying upon rulebooks and routine, but the pressures of implementing new technology projects have necessitated a shift towards managing informal, tacit and contingent forms of knowledge. These issues will be considered in more detail in a later section of this chapter.

Chapter 3 described the history of banking in the UK and showed how the passage of time has tended to entrench rather inflexible procedures and practices which emphasise the role of financial institutions as safe havens for depositors' funds. This policy has on the whole been very successful, but the focus on stability and continuity has not prepared the banks for coping with the very different operating conditions that prevail today. In particular, the perceived need to control banking activities in the interests of investor protection has resulted in a climate of dependency upon internal regulations and functional specialisms. Leonard - Barton (1995) noted how organisational routines tend to *'solidify'* over time around a consensus about *'the way things should be done'*. She suggested that this mindset was difficult to change in practice, because increasing demands for integration of information across organisations meant that zealously guarded internal knowledge now has to be shared amongst individuals from differing functional backgrounds and codified in compatible computer systems. The contention that routines are essential merely because they have *'always been done that way'* is no longer valid. Leonard - Barton memorably compared the development of these routines to training fleas:

> *"...the tendency is to discourage innovation and train people as fleas used to be for a circus. Enclosed in a glass tube, the fleas slammed into the invisible force above them every time they hopped. Thus trained, they 'learned' to crawl, so that they could be docilely harnessed to tiny wagons and encouraged to crawl across minuscule tightropes. Employees can likewise be trained to adhere to the past, mindlessly. Thus trained, they may continue routines long since outdated." (p. 37)*

To focus on risk-avoidance in the manner long practised by the banks, therefore, may have succeeded in reassuring customers that their investments were secure. The policy has, however, done little to equip the banks for successful implementation of a series of new technology projects in an environment where very different skills and priorities are required. This finding is supported by Fincham et al (1994) who observed the difficulty of changing dominant skill structures, which they described as '*institutionally embedded*' over time. The most significant influence they identified upon the development of new technologies was the particular knowledge base and skills that already existed within the firm. Unavailability of expertise tended to constrain strategic choice, thereby limiting and conditioning the developmental possibilities along familiar lines.

This finding was also observed in some of the case study banks, particularly within the IT departments themselves. In Bank A, the interviewees reported that there had been a more ready adoption of the new working practices they had introduced by the business users, than by the IT department which developed the new technology:

"I think it is probably more painful for people in IT to change the way they do things. Business people see it in terms of business cost and business benefit, and are much more enthusiastic for what we are doing. So when I have contact with the business areas, I do not feel that I have to sell what we am trying to do, because they have already bought into the idea in a big way. It's more a case of educating them in how we are going to do it... methods and timing. Getting developers who have been doing things one way to change the habits of a lifetime is much harder." (Project Manager)

"There are people in IT who like technical toys... but just because people like new technology does not mean that they want to change the way they work... so they might want to use the new toys in the same way that they played with the old toys." (General Manager)

The degree of resistance demonstrated by IT staff within Bank A to the project was an interesting issue to emerge from the interviews. Although such problems may have been anticipated in traditional areas of the bank accustomed to a rule based and hierarchical culture, it might have been expected that people employed in a systems development role would be accustomed to change and the need for flexibility, by the very nature of IT work. In practice, the business users across the bank could foresee the tangible benefits of systems integration as proposed by the project and were keen to progress, while it was perceived by the IT staff as a threat to established skill sets and power positions. This meant that significant difficulties were encountered from a managerial perspective in terms of group morale, as many individuals found their skills to be obsolete and their hitherto secure jobs under threat from new entrants. These staff had been used to a stable and undemanding environment, looking after an established and well known computer system on behalf

of user departments. They now had to acquire new skills as new technologies were introduced and deal with unforeseen problems in interfacing the new systems with the old mainframe, whilst coping with increasing demands and tight deadlines from user departments. In effect, the old working environment and culture was overturned in a short space of time, and uncertainty about the future encouraged rumour, speculation and confusion. One interviewee described the situation as follows:

"It was the senior staff who were in a position to be most obstructive... they saw all these new systems as a threat, and constantly put obstacles in the way to prevent them going live. There were complaints about incomplete documentation...or lack of training - anything to cause a delay. The people that were keen to increase their range of skills by learning new technologies tended to be the younger ones, but they did not have the authority to enforce their interests. These were key people with up to date project and system knowledge, but they soon became disenchanted and left the bank." (General Manager)

"So many people left that we had to hang on to the hard core - because any knowledge was better than no knowledge. These were the people whose skills had become degraded over time, they had been in this 'fur-lined rut' since leaving school and felt the company owed them a living... they were very set in their ways. So we are stuck with the die hards, while those that want to change things leave." (Project Manager)

The interviewees from Bank A believed that the resistance put up by the IT staff to the changing nature of their roles within the organisation was a major contributory factor to the failure of the project. In contrast, the business departments were keen to

reap the benefits of system integration and were prepared to accept the necessary changes in their working practices. A similar situation occurred in Bank C where the IT area tried to retain its usual working practices and resisted the changes that project implementation would bring. In this case, although the business areas would benefit from the new technology, there were many different branches involved world-wide with differing interests and priorities. They failed to agree project priorities amongst themselves and the individual in charge of the project lacked the authority to enforce consensus on either the system developers or the multifarious business users.

In Bank B, which was trying to develop links between itself and a number of partner banks for the purposes of creating a European wide payment system, it was the business area that was not committed to the project and resisted progress at each stage. The aims of the project directly threatened the existing skill sets and career paths of the individuals chosen to drive the project. The creation of a new payment system would prohibit achievement of departmental performance targets, which were based on commission taken from the volumes of traditional payments made, and upon which annual bonus payments were dependent. The number of standard payments handled by the bank would certainly fall significantly if a cheaper alternative service was to become available. Internal incentives to develop innovative international payment systems were therefore non-existent.

In Chapter 6 it was described how Bank D had successfully forged links between its systems and business areas within the London office, and how this co-operation had contributed to project success. In this case, the office had just completed a downsizing exercise and had made 45% of its staff redundant. One interviewee described how the individuals that had left tended to be the older ones who qualified

for sizeable redundancy packages, and were not comfortable with the changing nature and demands of their role within the organisation. The employees that remained tended to be younger, were more tolerant of change and prepared to learn new skills in order to remain valued team members in a very different environment. One interviewee with no IT background described how he came to work in Systems Development, by taking advantage of available training courses and actively seeking involvement in projects which involved IT:

> *"I knew my position within the bank was vulnerable unless I made an effort to retrain, and showed some initiative. Technology was becoming more and more integral to our business and many people could not cope with this. The bank was looking for people to interface between IT and the business... in a sort of analyst role really, so I decided to make myself indispensable. It comes down to learning the jargon, and not being afraid to tackle something new."* (Business Analyst)

In the case of both Mondex and First Direct, the problem of employee adherence to historical working practices was obviated by the total separation of the new ventures from the traditional activities of their founders. This strategy encompassed the recruitment of staff from outside the organisation - or indeed the entire financial services industry in some cases - and was ratified by the advantages of investment in customised new computer systems. Similar practices have been followed in other industries, notably by General Motors which set up a totally separate car plant in the US to build the new Saturn range, using Japanese production methods and quality standards, (Simonian 1996). The firm did this because it did not believe that existing factories would be able to change their working practices to the necessary degree, but only limited success has been experienced with the project. Rehder (1994)

showed that customer reaction has been positive, market share of the product has improved and productivity improvements have been made. Furthermore, the cost reductions achieved at the new site have subsequently inspired renewed efforts to introduce innovative management practices in existing factories across the US, a process referred to as '*saturnisation*'. The company still lags behind its Japanese competitors in terms of productivity because salary levels are high and the firm remains overstaffed.

It would be tempting for one to conclude from this section that the obvious way to alleviate internal resistance to new projects is to develop each new initiative in isolation from the main organisation, with its own unique staffing and technological support arrangements. As discussed in Chapter 6, this strategy is rarely practical unless the project in question represents an entirely new venture for the company. Many of the new technology projects under consideration by the banks concern improvements or upgrades which need to be integrated with existing services that are already operating on a daily basis. In these circumstances it would be impossible to isolate the project in the manner successfully adopted by Mondex or First Direct. A more realistic strategy would appear to centre upon improving the communication and relationships between business and IT areas, to the extent of developing a more flexible and IT literate workforce, with a skills base that is relevant to the current needs of the industry. The next section of this chapter considers what steps have been taken by the case study banks in pursuit of this goal, and evaluates their effectiveness in terms of the relative success or failure of the projects in question.

RECRUITMENT, TRAINING AND GRADING POLICIES

The traditional career path followed within the UK banks was for staff to join from school - or more recently university - at the bottom of the ladder and work their way up through a rigid grading structure over a period of many years. Length of service was therefore the primary criterion of promotion prospects, and the 'job for life' culture firmly entrenched. This policy meant that staff were effectively rewarded for getting older! As recently as 1990, it was considered unthinkable when a manager of Bank B resigned to join the direct competitor Bank A:

> *"When news of my resignation leaked out, people passed me in the corridors without speaking. After a series of high level crisis meetings I was asked for my car keys and escorted from the premises."* (Project Manager)

Bank A operated a single grading structure for both commercial and IT staff, although in practice, IT staff tended to occupy the lower grades, and rarely moved across to a business area. Within these grades, salaries could vary widely depending upon market demand for particular skills:

> *"It is probably true to say that a technical specialist may be well rewarded if he is perceived to be 'indispensable' - but he may find it hard to move to a more general role... or attain staff responsibility which still remains the traditional route to seniority within this organisation ... and in many comparable companies as well, I would suggest. In general terms, the more technical the role, the lower your grade within the bank."* (Project Manager)

One individual within the IT department of Bank A was only tolerated because he was the one person with the necessary skills to perform the particular tasks required. He consistently failed to meet deadlines but was aware of his pivotal role within the project and exploited the fact. An interviewee noted how project progress depended too much upon a few individuals like this who had been involved from the start, as little attempt was made to disperse their skills more widely:

> *"There is no cross-fertilisation of knowledge to reduce this dependency...some people are so much in demand that they cannot get anything done, or they are able to trade on their importance by demanding more money."* (Project Manager)

The interviewee went on to describe how skills shortages were temporarily alleviated, (at significant expense) by employing external consultants or contract staff, but when these individuals moved on their accumulated knowledge moved with them. Bank A tried to write instructions into the contracts of temporary contract staff which obliged them to transfer their skills to permanent employees during the time period of their contract. The logic behind this *'skill-scraping'* policy was for the experienced temporary staff to train new recruits, who would then replace their mentors at a much lower salary. In practice, the contractors were naturally reluctant to pass on their knowledge and then lose their jobs. A number of people employed by technology supplier organisations were also seconded to the project. These individuals knew the full capabilities of their hardware, but they were put under so much pressure to resolve a series of minor crises that few opportunities remained for them to pass on their knowledge. Training courses were available in managing the changes associated with new IT systems. It was intended that relationships could be built up between the business and IT departments if representatives from both areas

attended these courses together, but the contacts built up were only transient because of the high staff turnover within IT. The interviewee suggested that these examples of poor knowledge management throughout the project compromised the opportunity to implement technological change successfully and hence generate competitive advantage for the bank.

As the recession hit the UK banks in the early 1990s the predictable career structure began to break down. After rapid expansion during the 1980s recruitment practically ceased at Bank B overnight. Consequently the elaborate sequences of promotions from grade to grade were compromised, as no newcomers came in to take the junior jobs and free the present incumbents to move up the hierarchy. In addition, people who retired were not replaced, and their jobs were amalgamated with others or downgraded. People who had expected to progress from job to job now had to be content with their existing roles for an indefinite period - or face redundancy in some cases. Others wanted to retain their current roles, but still expected promotion due to their length of service. Morale suffered as a result and the more ambitious individuals began to leave. In a climate of cost control which had manifested in automation and branch closures, Bank B was keen to cut staff levels even further, so active recruitment did not resume as economic conditions improved. One interviewee described how some new employees were taken on for specific roles at junior levels, and there was a deliberate policy to target people without career expectations who were unlikely to become disappointed at the limited prospects on offer. As a manager who had benefited from a rapid rise up through the grades in the past, the interviewee was pragmatic about his own future prospects:

> *"People are more realistic now and do not expect the regimented progression from within that used to happen. Structures are flatter now, and there are less*

opportunities, you have to be more proactive in spotting appropriate openings and making sure you are ideally placed for them, and this probably means taking a sideways move to be in an area where a promotion may be available in the future." (Marketing Manager)

An interviewee from Bank D described how the bank was trying to move away from the elaborate grading structure that had evolved over many years:

"We are now concentrating upon broadening people's experience rather than promoting them, and trying to wean people off the idea that you always need to get grade promotions. We try to pay them more for knowing more, and move them sideways within their grade to learn new skills. Giving grade increases tended to raise peoples expectations above the ability of the person... and sometimes those promotions reflected an individual manager's personal preferences rather than ability. So we try to pay people better for experience and knowledge. Promotion is still available if people want to move to a different team or country. The career path cannot be vertical any more because we only have four levels. " (Business Analyst)

The problems of losing good IT staff from Bank A and Bank B were discussed in a previous section. One of the Bank A managers who resigned described how his replacement was selected:

"They advertised my job and I was asked to help interview for the replacement. The money they offered was only attracting new graduates or people with limited experience. They needed to offer another 40% to get people with the ability to step right in to the job, but were not prepared to do

> *that. In the end, a guy that used to work for me and left, has now come back to do my job on contract terms. He is earning a lot more than they were offering to a new permanent employee."* (Project Manager)

The above examples from the case study banks suggest that despite recent initiatives to break down dysfunctional grading structures and encourage the development of new knowledge bases, there is still ample scope for improvement in the management of expertise. On a more positive note, recent research by Morris and Westbrook (1996) focused upon the successful implementation of a new technology project at Midland Bank. They found that success was facilitated by the replacement of Midland executives at senior levels with experienced and knowledgeable managers from outside of the bank, which was an unprecedented step at that time. These individuals brought in a fresh approach and new ideas that proved invaluable. The project teams contained individuals who were experienced in all relevant skills and the centralised processing areas created were managed by people with the specific skills necessary for that type of work, rather than the 'generalists' produced by traditional management training methods. The 'Taylorist' management principles followed were particularly suited to the routine nature of processing work - and already familiar to staff and management - a factor which enabled continuity of working conditions to be maintained, and eased acceptance and implementation of the project. In other words, the project succeeded because there was no need to redesign jobs or introduce innovative working practices that may have met with resistance. This raises questions about the viability and successful implementation of future projects that may necessitate more radical changes within the organisation.

O'Sullivan, (1996) reported how General Motors sought expertise from outside the automobile industry when restructuring its European Business Team in response to increasing competition. People with brand management experience in a diverse range of industries were recruited to bring in a fresh approach that was not conditioned and limited by preconceptions of how cars should be sold. Representatives of Bank A and Bank B also noted an increasing tendency in recent months for people to be recruited at managerial levels from outside the organisation. The Bank A example was described in the previous chapter where an additional management layer was created within IT. In this specific case the strategy was cited as contributing to the failure of the project, but within Bank B the general concept of external recruitment was gaining in popularity:

> *"Yes, more and more. We are recruiting IT people, personnel people, press people, marketing people. It's still unusual within the branch network, but quite common in strategic and specialist roles. It's very beneficial... you get professionals rather than the GP." (General Manager)*

Bank D recruits staff externally at all organisational levels, and it is considered acceptable to leave the bank and return to another role later on. One interviewee commented that this was common practice and often constituted a viable career move. He noted that the standard personnel forms completed by all staff include the categories *'hire date'* and *'re-hire date'*.

At First Direct staff were selected on the basis of their communication skills rather than past banking experience, which was actually perceived as a disadvantage. Interviewees claimed this was because the policy of adopting a totally new approach to retail banking required no preconceptions of what the roles of the staff should

entail. Many work part time as the provision of a 24 hour service allows flexibility of working conditions. The team based working structure at First Direct is organised around shift times so any customer could deal with any member of any team, depending upon the time of day when they call. The emphasis upon quality service means that training is given high priority within the bank. Each new telephone operator receives 7 weeks of full time training before answering calls and training is topped up every 6 months depending on individual needs. The courses available include communication skills as well as specific product training. Calls are often monitored to check staff response in real situations and *'mystery shopper'* calls are also common.

Similarly, all Mondex employees were recruited from outside Natwest. Many had backgrounds in industries other than financial services. No arrangements are in place between Mondex and Natwest, or indeed Midland and First Direct, to exchange or rotate their respective staff and management. An interviewee from Mondex described the attraction of working for an industry newcomer in the following terms:

> *"The challenge of building up electronic cash is a strong motivator on people to perform. It comes from outside, and is far stronger than any internal attempts to get the best out of people. It's a self selecting group... if you did not think it would be a winner you would not join the company, and this is a very different group of people from your average bank employee. If you asked someone from Natwest about Mondex people they would say, 'they are a bit different from us' and they might appear envious...and not altogether supportive. It's unlikely anyone would say... 'what a great bunch of guys.'*
>
> (Marketing Manager)

Yet again the above examples indicate the advantage to First Direct and Mondex of starting with a clean sheet of paper and being able to select appropriate staff with no historical preconceptions of the nature of their roles within the organisation. In contrast, this section has also highlighted the problems faced by the other case study banks in attracting new staff and changing the skills and expectations of a workforce used to a far more stable environment and conditions of employment. The problem for organisations of losing their best people has recently been labelled by the press as *'bright-sizing'*. As illustrated in the case of Bank D, individuals who have the capacity and enthusiasm to learn new skills would appear to be the very people the banks need to retain as new technology systems are introduced. It is interesting to speculate whether the home banking project at Bank D would have been as successful if the office had not recently lost 170 of its more senior and traditional staff through a generous redundancy programme. The final section of this chapter reviews how the banks have attempted to broaden the skills of their workforce to varying degrees by a process of *'hybridisation'*, and considers how this strategy impacted upon the specific projects studied.

HYBRID MANAGERS

In the study by Fincham et al (1994) referred to earlier, an increasing tendency was noted for power to move away from hierarchical management towards the possessors of technical knowledge, as IT projects became increasingly strategic and central to key business activities. At the same time, users became more demanding as they acquired a level of technical knowledge and ceased to accept solutions that could previously have been imposed by system developers. The authors suggested that the development of *'hybrid expertise'* was necessary to reconcile these

dynamics, ensuring technology was integrated with business requirements. They quoted Earl (1989) who defined the hybrid role as follows:

> *"...hybrids are people with technical skills able to work in user areas doing a line or functional job, but adept at developing and supplementing IT application ideas." (p.205)*

There was little evidence of deliberate hybridisation in the cases studied by Fincham et al, but the policy was successful on the occasions when such roles evolved during project implementation. For example, they describe how in Bank of Scotland systems development was the joint responsibility of a systems analysis and programming area, and also a business analysis team. Crucially, these two groups were placed together both geographically and structurally within the organisation, which facilitated communication. The business analysts were hybrids whose role was to make a business case for new projects and interface between developers and users. They regarded themselves as bankers rather than systems staff, although most had a computing background. As such, they spoke *'the language of both sides'* and were able to mediate effectively in disputes. The developers resented the incursions into their traditional knowledge base by the hybrids and were keen to show up any lack of computing competence that they displayed. Despite this, the contribution of the hybrids was instrumental in the success of the projects studied.

Other writers have advocated the deliberate cultivation of hybrid skills in order to facilitate technological innovation. A study of expertise management by Howells (1997) of the failed interbank EFTPOS project, noted the difficulties experienced by the banks involved in assimilating the necessary expertise to develop an innovative project within a traditional organisational structure and culture. The major problems in

this case concerned rigid separation of commercial and technical functions within the banks, and the existence of many hierarchical layers of management separating those individuals with the power to take strategic decisions from those who had assimilated 'hybrid' knowledge. The author concluded that the success of future network innovations could be facilitated by active, strategic management of expertise within the organisation so that hybrid knowledge was available to aid project implementation from the outset. This would be an improvement upon earlier examples where expertise was accumulated by trial and error during the project itself, and therefore acquired too late to be of significant value at the time.

Willcocks and Mason (1987) described how Citibank in the USA had encouraged the development of hybrid skills by removing the intermediary systems analysis function altogether. This strategy forced business users to develop their own skills in systems analysis. Support was provided by training courses in managing technology and the backing of contract technical staff was available to the users if required. Outside of the banking world, Scarbrough and Corbett (1992) noted that other industries had also experienced considerable success in developing hybrid managers. In particular, Esso UK claimed that 90% of IT projects were now delivered on time and within budget after involving hybrid managers, compared with 60% beforehand.

The development of hybrid managers would seem to be a practical solution to the misunderstandings between IT and commercial employees raised in this chapter that have tended to compromise the success of new technology projects. There has, however, been criticism of the hybrid manager notion in the literature. Critics focus upon the perception that such individuals lack credibility in either the IT or the business areas, because the necessary broad approach of the hybrid would mean that detailed knowledge of either speciality was hard to sustain (Simpson 1991.) In

addition, it has been claimed that the speed of change in the industry is such that the technical skills of the hybrid manager soon become outdated and redundant, (Currie and Glover 1996). The authors based this conclusion upon the findings of their empirical research in which 'hybrids' were criticised within their organisations for spreading themselves too thinly, and as a result lacked the necessary depth of knowledge of either business or technical issues.

Within the case study banks, very different attitudes towards hybrid managers were displayed. According to an interviewee from Bank B:

> *"If you put a banker into an IT role you can add value from a naivety point of view, you ask strange questions...bring in fresh ideas, different experiences."*
> (General Manager)

This individual was referring to his own experience as he had spent two years as Deputy to the Head of IT at Bank B. He had a general banking background, and no prior knowledge of IT. Although he believed that his commercial background was of value to the IT area, the decision to promote him to this role could not be regarded as an attempt on the part of Bank B to cultivate hybrid skills. The move was regarded as unique within the bank and he was subsequently promoted again to a banking role with no further IT involvement.

In Bank A, occasional attempts were made to create 'hybrid managers' with knowledge of both technical and business issues to bridge the gap between users and system developers. These individuals tended to lack credibility in either camp and their knowledge was perceived as superficial or out of date. Possibilities within IT were limited if a technical manager wished to make a career move within the

organisation, whereas commercial roles carried more money and status. In these circumstances it was rare for commercial managers to seek a career move into IT. Occasionally IT management were rewarded for technical excellence by promotion out of their area of expertise and into 'people management', a task for which some were ill equipped. In addition, the organisation no longer benefited from their technical skills. It was described earlier that Bank C maintained rigid demarcations between systems and business staff, and it did not encourage cross over between the areas. This separation meant that there was no capacity for either the IT division to impose the system on the businesses, or for the business divisions to enforce their particular requirements from the new system. One interviewee also noted that users were reluctant to admit to their lack of technical knowledge when checking that system specification matched their business requirements, which led to misunderstanding and errors. The person in charge of the branch integration project was actually seconded from a business area to run the project and he had no prior IT experience. After implementation of the scaled-down version he was returned to a business area, and the project management experience that he had accumulated was therefore lost. These cases appear to exemplify the typical British notion that access to senior management levels should be via a general management route rather than a technical one. This situation is investigated in more detail in the next chapter which analyses leadership issues within the case study banks.

In contrast, interviewees from Bank D were enthusiastic about the value of hybrid skills:

> *"We encourage the development of a team of 'superusers' who have bought in to the project and been involved from the start. You pick the best users and use them to train the others. However, the best users are always going to be*

> *required elsewhere, and that is where senior management come in ... if they are prepared to spend whatever on the project then they should ensure that the best people are employed on it. The superusers have credibility in the eyes of their peers, and they can sell the project for you."* (General Manager)

The interviewee defined the 'superuser' as an employee of a business area who was able to use development tools and tailor them to meet particular needs - without needing to ask a programmer for help. Another described how business analyst roles had developed from the 'superuser' concept:

> *"They are not programmers but they are able to fill the gap between business and IT... have an empathy with both areas and talk the IT language. They are hybrid people really. It's a matter of learning the jargon."* (Marketing Manager)

In addition, each of the industry consultants interviewed had noticed an increasing trend towards hybridisation and results were usually positive. One commented that some banks were taking the idea of knowledge management even further and developing their own internal consultancies. This role could be described as a research and development function to anticipate and monitor changing technological trends in the industry. An example of such activity within Bank B was described in Chapter 6. In addition, Mondex has a growing reputation as centre of excellence in research and development. This capability is reflected by its role in the development of new smart card applications, enhanced chip technologies and spin-off products and services. The skills acquired help the company in its certification of Mondex equipment and compatible products, to ensure that all suppliers meet the company's exacting technical and service quality requirements.

CONCLUSION

Another prominent theme to emerge from grounded theoretical analysis of the data concerned the difficulties inherent in managing shifting knowledge requirements throughout the technological change process. Conceptualising the many different forms of knowledge discussed in the literature helps to expose the limitations of the banks' traditional reliance upon formal means of knowledge acquisition and transfer. The literature review has also highlighted how the problems of managing knowledge become more acute when new technology projects are developed which may have to be integrated with more traditional business activities. At this point, it is interesting to note the recent findings of Stewart (1998); while 70% of the top 1000 companies have introduced expensive knowledge management projects, his reserach suggested that the most effective technique may still be the coffee pot!

This chapter has described how the empirical data resonates with the findings of the literature reviewed, and also makes an interesting contribution to our understanding of this subject. As expected, the case study banks met a significant degree of resistance to the changes in working practices and conditions that arose during the development and implementation of the new technology projects. The main source of resistance varied from bank to bank, but was exhibited to a considerable degree by members of the IT departments themselves. This problem adversely impacted upon the projects studied in Banks A , B and C, despite the attempts of the banks to build new knowledge structures and integrate business and IT functions where possible. The process has involved experimentation with external recruitment, breakdown of traditional grading structures and the hybridisation of expertise; to varying degrees and with varying amounts of success in the case study banks. To summarise, an

industry consultant defined the necessary criteria for project success in one sentence:

> *"It comes down to the support of the senior management team, and having the right people on the team, with the right attitudes and skills - technical and business - and the right mix of internal and external staff."*

Unfortunately, as the stories told by the interviewees reveal, these ideal conditions did not apply to the somewhat chaotic circumstances in which the projects had to operate in practice. Consequently, data analysis suggests that appreciation of the difficulties associated with effective knowledge management may be a further contributory factor to our understanding of the productivity paradox.

CHAPTER 8 - THE ROLE OF LEADERSHIP IN THE TECHNOLOGICAL INNOVATION PROCESS

INTRODUCTION

This chapter reviews literature on the nature of leadership, and considers whether a relationship existed between the different leadership styles adopted in the case study projects and the extent to which each project could be said to be 'successful'. The findings of earlier research in the banking industry are also integrated where relevant. Grounded theoretical analysis of this data provides insights into the motivations of visionary leaders, and also improves our understanding of ways in which the implementation of new technology projects can be facilitated by effective management. For example, the projects inspired and run by effective leaders and managers appeared to be the most successful, but this rather obvious statement raises further questions about the extent to which leadership skills can be isolated from the degree of organisational support - or indeed constraints - with which these individuals had to work.

In the specific empirical cases under consideration, the subject of leadership was raised in two distinct, although related, contexts. The first concerned the nature and influence of the driving force behind innovation and change at the organisational level, and the second related to the actual role of specific project managers in running new technology projects. This chapter considers each of these issues in turn. It concludes by comparing the knowledge backgrounds of each of the individuals involved with their respective management skills and the degree of project success that was achieved in practice.

THE NATURE OF LEADERSHIP

Buchanan and Huczynski (1997) noted that considerable research interest in leadership issues was stimulated in the 1940s by the famous Hawthorne studies, from which it was concluded that the performance of employees could be influenced by effective leadership. Since that time, many writers have emphasised the relationship between organisational performance and quality of leadership, although the distinction between 'management' and 'leadership' is often ambiguous. Katz and Khan (1978) defined leadership as *'an influential increment over and above compliance with the routine objectives of the organisation'.* This implies that a distinction can be made between 'managers' who work within given organisational parameters, and 'leaders' who take initiatives to accomplish innovative goals which extend beyond a narrow functional remit. The concept of leaders as 'visionary' is also implied in an alternative definition by Bryman (1986) who categorised leadership as *'the creation of a vision about a desired future state which seeks to enmesh all members of the organisation in its net.'* In contrast, he saw management as *'a preoccupation with the here-and-now of goal attainment'*. Further confirmation of the validity of this contrast is provided by Buchanan and Huczynski (1997) who classified managers as *'operators, technicians, fixers and problem-solvers',* and a leader as *'visionary, prophet, catalyst and mover-shaker'.* In these terms, both managers and leaders are considered in this chapter; the former is represented by people in charge of new technology projects in the case study banks, and the latter by individuals who have developed their own innovative ideas through to implementation. It must be borne in mind, however, as Buchanan and Huczynski noted, that confusion can easily arise because in practice the two roles can be performed by the same person.

So what qualities do successful leaders possess? A review of the literature provides a variety of answers to this question. Adair (1990) identified three primary characteristics of effective leaders. He called the first 'direction', meaning the ability to communicate a vision of the future and unite people in their pursuit of this goal. The second feature was 'team-building', whereby a leader would put together an effective team, which itself formed part of a wider network of formal and informal contacts that could be drawn upon if required. The third characteristic identified was creativity, which allowed innovative behaviour to flourish at all levels of the organisation. 'Softer' leadership traits are becoming increasingly fashionable, as a recent report (Sunday Times 26th July 1998) - which was appropriately titled '*cuddly bosses come top in the business jungle'* - clearly shows. The article reported that a study of top management in 500 companies world-wide had identified 'emotional intelligence' as the major criterion for effective leadership. The report defined the key attributes of emotional intelligence as being *'empathy, communication skills, motivation and confidence'*. In contrast, Chakravarthy and Gargiulo (1998) described how the CEO of General Electric was regarded as '*ruthless*' and '*authoritarian'* in the way he went about transforming the performance of the company.

De Vries (1997) noted that many studies have emphasised the importance of 'charisma' as a characteristic of successful leadership. This attribute of leadership was shown to be influential in developing trust and changing the values and behaviour of subordinates, thereby enhancing organisational effectiveness. A famous example of organisational transformation under this type of leadership at the Brazilian company Semco has been described by Wilson (1996). The newly appointed chief executive, Richard Semler, began by cutting the levels of management from 12 to 3, and abandoned formal hierarchy altogether. Instead, workers were encouraged to set and manage their own production targets, decide

how many hours to work each day, formulate marketing plans, hire new colleagues, and appraise their own management. In addition, 23% of company profits are distributed equally amongst the workforce each year. The level of trust placed by Semler in the workforce has inspired such respect for his leadership that organisational productivity has increased sevenfold, and the waiting list to join the company now extends to thousands. Similar, if less spectacular, findings were reported by Bryant and Kearns (1982) in their study of the use of Japanese 'quality circles' in Western settings. Again, the value attributed by the leader to the workers' contribution to the quality circles was instrumental in building trust and improving productivity, this time in an American naval dockyard.

THE ROLE OF THE VISIONARY LEADER

Morris and Westbrook (1996) studied the successful introduction of a major new technology project at Midland Bank, and identified the inspirational leadership of the new CEO, Gene Lockhart, as a major contributory factor to project success. Midland had appointed an outsider in a radical attempt to arrest decline in the late 1980s. This individual had a technical background as an IT consultant, and at the time of his appointment it was unprecedented for senior executives to be recruited from outside of the bank. He initially ran the IT Division, but was soon promoted to head the entire Midland Operations, and then became CEO. His strengths were considered to lie in his persuasiveness in committing other senior management - both psychologically and financially - to a shared vision of success, and also in the value of the new ideas and perspective which his technical and management training in the US brought to the organisation.

Similar results were noted by Scarbrough and Lannon (1988), who described how the fortunes of Bank of Scotland were transformed by the appointment of a young, dynamic General Manager. The new leader supported champions of innovation within the bank, and instigated a major restructuring exercise which aimed to integrate technology policy into mainstream activities. This process stimulated awareness of the long-term implications of new technology on banking operations, and HOBS (Home and Office Banking System) was launched in 1985, many years ahead of the competition. The bank is now regarded as a market leader in its utilisation of technological innovations, in stark contrast to the position in the 1970s when Bank of Scotland failed to recognise the potential of ATM technology and lost significant market share to its rivals.

An interviewee whose role was a banking industry consultant described his experience of visionary leaders as an advisor to Direct Line. The Chief Executive, Peter Wood, started the company in 1985 with 3 colleagues, all with IT backgrounds. His innovative idea was to offer a service whereby insurance policies were underwritten by the firm itself and sold directly to the public over the telephone. Wood's idea of combining the underwriting and selling functions was distilled from his knowledge of the insurance industry, business practice, and the availability of appropriate IT solutions. Royal Bank of Scotland was the only major market player to provide financial support for the venture, and Direct Line went on to achieve considerable market success as a result of challenging the industry norms. In contrast to accepted industry practice, Wood recruited his management team externally, and his staff from the dole queues. When taking on new employees, previous experience within the insurance industry was regarded as a disadvantage, in order to avoid introducing traditional values and practices. The primary skill required of employees was a good telephone manner. Wood appears to fit the

criteria of the ideal 'hybrid manager' whose value as facilitators of new project implementation was described in Chapter 7.

Although these examples emphasise the merits of visionary leadership, Schein (1992) claimed that such cases tended to form the exception rather than the rule, because little is known about the actual role of the leader in the innovation process beyond the usual generalisation that senior level commitment is necessary for project success. He found that most studies concentrated upon the conflict between differing technical and managerial perspectives, rather than analysis of the actual impact of the leader upon the success of the project. Schein did not deny the value of inspirational leaders, but concluded from the results of a survey he undertook in the USA that heroic change agents were numerically unrepresentative in comparison with their more conservative counterparts. In the organisations he studied, the leaders tended to adopt a cautious and pragmatic attitude towards new technology, focusing upon incremental improvements in service quality or cost savings, rather than on radical business transformation. Schein claimed that the importance of risky but glamorous ideas espoused by the leaders of organisations such as First Direct or Mondex has been overstated, because less radical approaches are not considered to be so interesting or newsworthy in comparison. He concluded that 'thinking outside the envelope' was now assumed to be an essential pre-requisite of business success only because of the disproportionate publicity that such cases attract.

Certainly both of these projects have received considerable attention as examples of radical innovations inspired by visionary leaders. The Mondex concept was derived by two senior managers from National Westminster Bank; Tim Jones and Graham Higgins. As members of an internal 'think tank' they were charged with looking for the next significant change in the payment card business. Considerable research

resources were devoted to the task, and both individuals have retained a leading role throughout the Mondex project development and implementation.

> *"We are driving Mondex to become the world's leading electronic money product, not just 'a technology'. Mondex is a piece of the infrastructure of the 21st Century."* (Tim Jones in the Financial Times, 10th January 1997)

All the interviewees from Mondex were proud of the success that the company has so far achieved, and extolled the virtues of belonging to a dynamic and innovative organisation that was inspired by the vision of its founders. They were less keen to admit that the Mondex brand has been developed largely on the strength of its links with established market players, particularly MasterCard:

> *"If I'm really honest about it, we relied heavily upon the reputation of our backers, particularly in the early stages. Without that support we would not have passed the 'great idea' stage."* (Marketing Manager)

The same caveat can be applied to First Direct. The leadership style within the bank is very open and the management structure flat. Teams of 8 -12 people are co-ordinated by a team leader into a pattern of shift work that ensures 24 hour cover. One manager looks after several teams, and the only other management layer is director level. All employees, including the Chief Executive Peter Simpson, work in an open area without private offices and are on first name terms. The bank has devised its own grading structure that is entirely separate from the Midland system. Career progression is based upon performance rather than length of service. The flat management structure means that decision-making is delegated to the staff answering calls, and this improves service quality as many customer requests can be

handled immediately, without the need to follow a lengthy authorisation process. The value of this leadership style was described by the interviewees as follows:

> *"Morale is high here, and we all take pride in seeing the rapid growth of the business. There is nobody looking over your shoulder to check up on your work, so management are regarded more as facilitators...helping us to do our jobs... rather than policemen who need to maintain control. In this atmosphere, people are able to use their initiative and do not fear failure. It's quite a dynamic place to work really."* (Telephone Operator)

> *"The First Direct brand is its people, there is no physical infrastructure that customers can interface with. I think the reason the service quality is so high is because of the commitment of the staff... and the reason staff are so committed is because of the way this operation is run...it's certainly not your standard and boring bank branch."* (Telephone Operator)

> *"Why do I like it here? It's because of my manager really, who lets us get on with things, and take our own decisions in response to customer requests. For the first time, I have a job which is not made difficult by the management team."* (Telephone Operator)

> *"We've got the technology, which makes the work easy, but it's the people really, who make the difference. You never hear derogatory remarks about the management, we are all part of the team and it is not always possible to tell who is in charge."* (Telephone Operator)

Some of these comments could have come straight from the bank's promotional literature. Although often somewhat 'sugary' in tone, these judgements were delivered with apparently genuine enthusiasm in a number of separate conversations with different teams. Individual managers interviewed were also positive about the prevailing management style:

> *"I believe that the quality of our people are a unique asset to First Direct. New customers are not used to dealing with bank staff who can address their complaints or requests on the spot, and with such good cheer. We believe strongly in training, and empowerment of staff, and are prepared to commit to this. Consequently morale is so high that the place practically runs itself."* (Marketing Manager)

The value of isolating the Mondex and First Direct projects from the rest of the organisation was emphasised by the interviewees and echoed in an empirical study by Dougherty and Hardy, (1996). The authors also noted that innovators' best chance of success came when their project was "walled off" from the rest of the organisation into a separate product unit:

> *"These units created bubbles of innovation meaning that approached the ideal type, where innovation had legitimacy and value in the eyes of the participants. These bubbles were self-contained micro-configurations in which resources, processes, and meaning were aligned with innovation."* (p.1145)

However, whilst this policy may have paid dividends for the particular project under consideration, the authors claimed that it did nothing to enhance the innovative capacity of the organisation as a whole, unless specific systems were developed to

integrate the project with existing operations. By formalising innovation in this way, they believed individual project managers would have a greater chance of overcoming organisational resistance to their efforts. In the cases of Mondex and First Direct, the success of both innovative projects has yet to impact on Nat West and Midland in terms of the way in which each parent company is structured and managed. In fact, it is no longer immediately obvious who the originators of the projects actually are.

The leadership record in the other case study banks was more mixed. Bank B is one of the more conservative of the UK banks and is not renowned for innovative leadership. Recent advertising promotions have emphasised the importance of historical continuity, and the stated intention of the bank is to concentrate upon its traditional strengths. One exception, as described in Chapter 6, concerns the sponsorship by the Chief Executive of a small 'think-tank'. This area is ring fenced from operational activities and charged with identifying industry trends and appropriate technological solutions. It provides another example of innovation in isolation from standard organisational practice. Although some ideas originating from this area have been commercially developed and are now offered as services by the retail bank, in common with the earlier examples this strategy has not impacted on the way in which the operating areas themselves are structured and managed.

The branch integration project studied at Bank C lacked senior level commitment during the extended life of the project, and still attracted little interest from top management after its failure. There was no accountability or analysis undertaken of what had gone wrong. The interviewees noted that the same problems which had compromised this project were repeated in subsequent ones, because no efforts were made to address the contributory organisational factors to project failure. Bank

C appears to be large enough to absorb the project costs, (estimated at £300 million over a six year period) without too many questions being asked, but a post-project review which would have analysed the reasons for failure was considered to be too expensive at a cost of £1 million:

> *"The review might well have pinpointed the finger at certain senior individuals who did not want to advertise their role in the failure of the project...so it was quietly swept under the carpet, and no organisational changes were made."* (Project Manager)

> *"You could understand it if it was a minor project, but this was a major company-wide investment, probably the biggest project ever. It is a weakness from top management. Coherent decision-making at a strategic level was totally absent. For example, just months after they introduced the system to Italy, it was decided that this part of the business would be franchised out in Italy. The buyer who bought the franchise rights did not want to use the system because of its limited capacity, so they took it out again."* (Project Manager)

When pressed on the issue of how senior management could get away with wasting shareholders' money to this extent, one interviewee summarised the reasoning behind the project, and the lack of accountability for failure as follows:

> *"I think the top management were in a dream world - they had this vision of the future that would restore past glories, and this alone was considered sufficient to justify the expense and risk taken. Anyway it's different for IT projects, the people authorising the expenditure do not understand the*

technicalities or what is considered a 'reasonable' price for equipment, they just accept what they are told. Rather than admit they do not understand, they will just say 'go ahead'. And this project has run for years - who now remembers who signed off on it? The bank is big enough to absorb failures like this." (Project Manager)

In contrast, the London office of Bank D underwent significant change under the direction of an inspirational leader. Although his achievements were recognised and held up world-wide as a model for the bank to follow, attempts to copy his management style in other parts of the bank have not yet succeeded. In a sense, the London office can be regarded as geographically ring fenced in the mode of First Direct or Mondex. The leader's role was described by one interviewee as follows:

"I think in any organisation undergoing this type of activity you are going to find one person driving change. He's made speeches, written books, made videos. He's well respected in the bank for what he's done. But although they've tried to repeat the experiment in other parts of the bank, it has not yet happened... so it is not that easy." (Marketing Manager)

"Our MD was previously our IT director, and he is very focused on using relevant new technology. He has built the area up to a position of strength so that all the other countries look to us for development. It is his leadership that has put us in such a strong position in the marketplace." (Business Analyst)

This section has compared and contrasted the findings of earlier research into the role of visionary leaders at the organisational level with the analysis of the empirical data. The issue of the prevalence of visionary leaders within the industry can only be

addressed by analysis of a much larger sample size, which is not within the scope of this thesis. The examples from the literature indicate that the effectiveness of such leaders in terms of the successful projects in which they were involved is considerable. The case study examples of Mondex and First Direct support these findings and have been well publicised success stories, but in addition the analysis of the empirical data has shown that the success cannot be wholly attributed to quality of leadership because the degree of institutional backing has played a crucial role. As Buchanan and Boddy (1992) pointed out,

> *"The key role of 'exceptional people' has to be balanced with an understanding of the 'extraordinary circumstances' in which they find themselves acting."* (p.65)

Furthermore, it is clear that the successful innovative projects studied have yet to inspire significant change in the broader organisational context, despite the considerable influence of their leaders.

THE ROLE OF PROJECT MANAGERS

At the beginning of this chapter the distinction was made between 'leadership' and 'management' in terms of the breadth of the role and degree of influence within the organisation. This section focuses upon the more pragmatic skills usually associated with day to day project management rather than innovative leadership.

In Chapter 2 the subject of 'change agents' (Buchanan and Boddy 1992) was introduced during discussion of the management of the technological change process. The authors sought to identify the nature of the expertise necessary for a

change agent in seeking to shape the outcome of a particular change project. They noted that the change management agenda varied depending on whether the project concerned was central or peripheral to the activities of the organisation, and whether the change programme itself was perceived to be radical or incremental. Specifically, the more radical and central the change programme, the more essential to the change agent were skills in resolving political tensions and conflicts rather than technical or project management issues. In particular, they described these essential skills as follows:

> *"...the politicking, the wheeler-dealing, the fixing and negotiating, the coalition-building and the trade-offs - which typically cannot be discussed in the organisation without damaging individual credibility or the legitimacy of the change attempt." (p.29)*

Bank C provides a good empirical example of a project manager who lacked many of the political skills necessary to progress his project in circumstances such as those noted by Buchanan and Boddy above.

Maidique (1980) classified several roles that he observed in studies of successful innovations. The most famous of these is the 'champion' who he defined as an individual who adopts an innovative idea and takes appropriate action to ensure it is successfully implemented in the organisation. Clearly, the existence of an individual prepared to go to considerable lengths to ensure a project is successful would appear to be a valuable asset to an organisation, particularly in situations where a number of projects are competing for limited resources. In contrast, however, Dougherty and Hardy (1996) downplayed the popular tendency to place emphasis upon individual champions of innovation, as a result of their comprehensive study of

innovative projects within a number of mature industries. They found that although specific project success was largely dependent on the efforts of certain inspirational people who were able to make use of their power and influence, such success rarely engendered long-term organisational commitment to innovation because of the limited scope of any one individual within the company as a whole:

> *"But rather than celebrate lone champions and other individual heroes, we suggest that primary reliance on such personal power is inherently ineffective for sustained innovation. Such power is limited by the reach of individual networks, knowledge, and experience and is easily uprooted by downsizing, restructuring, and changes in senior managerial focus."* (p.1146)

Despite the large sample size and range of industries studied, the authors found few examples of organisation-wide support for innovation as an essential business activity:

> *"Sometimes individuals were able to resolve project-to-organisation connection problems successfully by accessing resources, establishing collaborative processes, and creating strategic meaning for their innovation. But connections made in this way were fragile and vulnerable, because they depended on the initiatives of the incumbents of specific positions and their particular networks rather than on organisation-wide systems."* (p.1133)

These findings indicate that innovative projects tended to succeed despite adverse organisational conditions, rather than as a result of supportive organisational factors. Common problems faced by project managers included lack of access to necessary resources, and the receipt of only temporary support from senior management who

did not rate innovation consistently on their list of priorities. In fact, Dougherty and Hardy went so far as to claim that prevailing organisational systems actually encouraged conformity and stability:

> *"Innovation was not simply suppressed, it was unseen; it was ignored and invisible in a wider organisational community that could not understand its role."* (p.1134)

In these terms, the heroic efforts of individual 'champions' could therefore result in a successful project on a one-off basis without engendering any lasting commitment to innovation within the company. Subsequent projects would therefore come up against exactly the same problems. This scenario is similar to the case of Bank C, where the lack of learning from project to project was emphasised by a policy whereby project leaders with accumulated experience were moved on, and replaced by newcomers who faced the same difficulties in running a new project. To summarise, Dougherty and Hardy believed that the usual remedies put forward for solving innovation problems, such as the creation of product champions, or separation of the project from the standard routines of the firm, can only have short term value while the principles upon which the organisation is based remain as before:

> *"The longevity of such a solution is limited so long as innovation remains a foreign body in a system that values the routine."* (p.1147)

The case study banks provide many other examples of ineffective project management. In Chapter 7 it was mentioned that the leader of the European Payment System project in Bank B had been 'chosen' to direct the project. He was

also head of the department responsible for the bank's existing international payment operations. This meant that there was a direct conflict within his department between the need to meet performance targets - and hence qualify for bonus payments - which were based upon volumes of traditional payment business, and the task of developing and implementing a new service which would ultimately replace the existing methods. The large margins that the bank currently earns on international payment traffic would also disappear. This absurd situation came about because at Director level of the bank it was believed that the personal contacts members of the department had with management of other European banks would be useful in forging the necessary strategic alliances for a successful new payment system project. The decision was therefore imposed upon the department without careful consideration and consultation with the people involved. It meant that even the project manager had no real incentive to make the project succeed. One interviewee described the situation as follows:

"He (the project manager) was a company man through and through... with no desire to rock the boat. His main concern was to protect the day to day business that paid his salary and had given him the status he so much enjoyed. The new project was merely a nuisance, and as long as he could placate his bosses by demonstrating that some progress was being made, then things could more or less carry on as before. He was gambling on the notion that top management had no real interest in making the project succeed either." (Business Analyst)

It is fair to say that this attitude was shared by the majority of managers in the department. Each had forged a successful career based upon years of experience of traditional business and the establishment of a network of contacts within other

correspondent banks. The managers could map out likely future promotions within the same area which would be jeopardised if they ceased to fit the company mould. However able they might have been, individuals who did not fit in were distrusted and marginalised by their colleagues, so they tended to become frustrated and leave the bank:

> *"My boss was a bit of a maverick...he had been transferred from a subsidiary company and had no time for all that 'old boy' stuff. He was always complaining about all the politics, and warning of the consequences of such introspective behaviour...but his early enthusiasm to generate change soon evaporated. He left to join an organisation that was less monolithic, less political, less wrapped up in itself."* (Marketing Manager)

The tendency of able managers to migrate to organisations with a culture more sympathetic to their aspirations will be explored further in Chapter 9.

The view of the project manager that the creation of a European-wide network for exchanging international payments was not highly rated at senior levels of Bank B, appears to have been endorsed by the passage of time. Originally billed as a solution for '1992', which was the magic date for creation of a single European market, Bank B only operates a small scale pilot scheme some six years later. The vast majority of international transfers are still handled in the traditional manner. The same manager is still in place, and the slow progress has not been questioned within the bank. Pressure has been exerted by the European Commission to stimulate change, but there is little competitive threat within the industry as all the banks are continuing to profit from the status quo. The competition from industry newcomers is not yet considered viable enough within Bank B to disturb this rather complacent attitude.

In Chapter 6 it was described how a new layer of management was introduced to the IT department of Bank A, while at the same other areas were simplifying their hierarchical structures by removing management layers. Interviewees from Bank A directly attributed the project failure to poor leadership. They explained that the first thing the new IT manager did was sack all the contract staff as part of a cost cutting exercise, and they were told to leave overnight. These individuals were professional and motivated people who had assimilated a considerable amount of project knowledge, and their loss was keenly felt. In addition, within the IT department, there was no coherent infrastructure in place to co-ordinate and control the different project teams. As a result, different sub-projects imposed their own procedures and standards. For example, within the same office some groups were working with Microsoft Access version 1 software, and others with version 2, which was fundamentally different in terms of its usage and capacity. Some sub-divisions of the project failed and held up the overall project because they became too insular and isolated from the overall goals. Teams wanted to see their 'own' bit of the project succeed without considering the impact upon other areas. This attitude was exacerbated by setting individual targets to project groups which did not reflect work being done in other areas.

The opinion of interviewees who worked within the IT division was that the new manager had been employed to convey bad news, to shake up the division and effectively take the blame for unpopular decisions from which the Finance Director wished to dissociate himself. To support this contention, one interviewee cited an earlier example of the Finance Director making a scapegoat of a particular manager when a project was delivered late. This individual was not given the necessary resources to run the project effectively, and other obstacles were put in his place, but

he was held to blame for the failure and left the company shortly afterwards. The new manager was unpopular with employees who were keen to progress the project and felt that her influence was jeopardising its success. They noted that she had favoured certain individuals and bought their loyalty as a shield against internal criticism:

> *"Some managers will do anything to keep in her good books. They know they are not doing the right thing, and they will tell you that out of the office, but it means they get more staff, or are considered for promotion etc. She has considerable influence, and has made some strange decisions, promoting people without the right background or experience. I think they realise that, and are grateful, so they work hard to keep in her good books. So it is not productive work that comes out of them, it's based on making her happy."* (Project Manager)

> *"There is starting to be a dawning that nothing is coming out of IT. There is a core of good managers in IT, but they are up against the IT manager and her cronies who want to keep things ticking along, have an easy life. So there is an underground IT management going on at the moment, trying to work out how they can bypass all this."* (Project Manager)

In this environment, the likelihood of implementing successful IT projects was considered to be remote.

Interviewees from Bank C again attributed failure to ineffective project management. They described how the person in overall control of the project had contributed to its failure. He was a Senior Vice President who reported to the head of IT world-wide, who in turn reported to the Chief Executive. Consequently he was not very high up in

the extensive bank hierarchy, and at the same horizontal level as the heads of the branches in which the project was to be implemented, so he had very little power. The manager was not a 'systems person' and had been transferred from a business area to head up this major IT project. There were several hundred people working on the project, which was of bank-wide importance. In this case the will to make the project succeed was there, but the manager lacked the authority to impose decisions on all the bickering branches of the bank that were involved. Geographically, the project was spread over many countries which made it hard to control, and psychologically many of the participants lacked interest in it:

> *"What became obvious during my time on the project was that managers did not always tell the project leader the truth, and so he did not know the exact situation. They could just sit there and tell him that everything was fine, or they were over optimistic...saying it will be fixed by noon or whatever, just to protect their own position. Most timescales set were so optimistic that they were rarely met and this created much negative publicity for the project. The markets were told they could come and test it in March, and it then it was June, and this went on and on. The head of the project then had to face all these market heads who were confused about what was going on and why the project could not deliver on time. There was a lot of time wasted on politics, managers playing one off against the other to enhance their own position within the organisation." (Project Manager)*

The interviewee described how the project manager was taken in by his subordinates' reports of project progress because in his previous role within a business area of the bank, playing such games was unknown. In this case, the project was internal, developed by IT for the benefit of the business areas, and there

was no external customer involvement. This meant it was considered fair game for participants to test out organisational politics in an attempt to further their careers. Had the manager been an IT insider, he would have been aware of this tendency and far more sceptical about reports of project progress:

> *"It should not have mattered that he was not a specialist in IT. He had all these VP's reporting to him and they were mainly IT specialists. He was there to manage a project, and in his previous role he had turned around a large market to make it profitable and did a good job. The problem was that people lied, and he was not used to that type of working environment."* (Project Manager)

In common with the earlier section that examined visionary leadership at the organisational level, this section of data analysis has illustrated how the influence of the personality and commitment of the project managers to specific project success cannot be examined in isolation of the operational constraints within which they operated. It is therefore difficult to assess whether more dynamic personalities could have overcome these problems. Even in the successful cases, no individual manager was able to instigate widespread organisational change that might prevent the same problems recurring in future projects.

THE KNOWLEDGE BACKGROUND OF PROJECT LEADERS

Currie (1995) conducted a survey of financial institutions which emphasised how information technology has developed into a strategic issue for the banks because it is used to increase efficiency, link remote locations, streamline processes and improve customer service. Despite the large sums of money invested by banks in IT,

her research indicated that technology departments are still regarded merely as support functions. For example, even senior executives in charge of large projects tended to have no technical background, as IT staff were rarely promoted to top management roles, and links with the business users were poor. Currie's survey showed that only 11% of the responding organisations regularly promoted IT staff to senior management roles, and 37% claimed that such moves occurred 'very occasionally'. In the remaining 52% there were no technical people at all in senior positions within the organisation.

These conclusions are borne out within the case study banks. The leaders of the new technology projects in Banks A, B and C had no IT background, although the leaders of Banks A and C came to their projects with reputations as effective managers. These were the two projects that turned out to be the most spectacular failures. In Bank C the knowledge gap was perpetuated because managers who had accumulated experience when put in charge of IT projects were transferred back to business areas upon completion of their projects. Consequently they were not able to make use of the knowledge acquired by running future projects. Conversely, the MD of the London office of Bank D had previously been the IT Director, and he retained enthusiasm and commitment to technological innovation which he encouraged amongst his employees, many of whom were new to IT. The leaders of First Direct and Mondex did not themselves have IT backgrounds, but the problems of managing IT within these organisations were less acute than in the traditional banks. There were no legacy systems to contend with and each operation was well resourced with dedicated teams of technical staff responsible for system development.

CONCLUSION

As only a small number of cases have been studied, this project does not attempt to contribute to statistical analysis of the prevalence of visionary leaders within the industry, or to the value of different backgrounds and experience in the context of the management of new technology projects. As it is impossible to isolate the individual leaders from the environments within which they operated, the extent of their influence is difficult to assess without tracking the record of a leader over an extended time period, encompassing a number of projects managed (ideally) for different organisations.

The case studies do illustrate that while there was a definite link between innovative leadership and project success, it was not the sole criterion. Analysis of the data has provided insight into possible ways in which the implementation of new technology projects can be facilitated by effective project management (Bank D). These findings therefore build upon the literature discussed in Chapter 2 that regarded technological change as a process able to be shaped and controlled by management action over an extended period of time. Few examples were found either in the cases studied or the literature reviewed whereby inspirational leadership resulted in definitive change at the organisational level - the influence of individuals was limited to specific projects. These empirical findings support the theory put forward by Dougherty and Hardy (1996) that organisations cannot sustain innovation over time because of the limited impact of any one individual in a situation where the overwhelming tendency is to maintain organisational continuity. The cases show that this attitude appears to be still prevalent in the banking industry, and the analysis adds a further dimension to our understanding of the productivity paradox. This issue is developed further in the next chapter that deals with the cultural issues impacting upon new technology implementation in the banks studied.

CHAPTER 9 - THE ROLE OF CULTURE

INTRODUCTION

In this chapter the role of culture in the technological change process is examined at both the industry and organisational level within the banks. Grounded theoretical analysis of the literature and empirical data from the case study banks shows that adherence to a culture based upon historical processes and values acts as an inhibitor to change, thereby constraining the potential of new technologies. This analysis process also enabled insights into the IT productivity paradox to be gleaned by drawing upon a body of literature not normally associated with the subjects of new technology and technological change.

The chapter begins by defining what is meant by the word 'culture' in an organisational context. The culture that has developed over time in the retail UK banking industry has been described in Chapter 3, so only a brief summary is provided here. This review illustrates how the culture has grown around an ethos of stability and continuity, so that technological change tends to be feared and avoided where possible. Analysis of previous research in the banking industry and the empirical case study data demonstrates the diverse range of impacts made by inappropriate organisational cultures upon the implementation of new technology projects. In turn, other cases also illustrate how a supportive culture can facilitate the change process. This analysis thereby builds upon existing theories of technological change that were introduced in Chapter 2. The literature provides conflicting accounts of whether culture can be changed - this chapter contributes to the debate by describing how one of the case study banks was actually able to create and

sustain a climate in which new ideas could be generated and turned into viable commercial products, through a process that involved a significant cultural change.

WHAT IS CULTURE?

This section provides a brief review of the literature on the nature of culture. It is not intended to be a comprehensive analysis of what is an enormous subject, but to form a conceptual basis for analysis of the impact of a 'banking culture' upon the implementation of new technology projects.

In general terms, Watson (1994) defined 'culture' as follows:

> *"the system of meanings which are shared by members of a human grouping and which define what is good and bad, right and wrong and what are the appropriate ways for members of that group to think and behave." (p. 111-112)*

The word 'culture' has been described in a business sense by Pascale and Athos (1982) as *'the philosophy that guides an organisation's policy towards employees or customers'*. Schein (1994) claimed that culture was the *'overarching determinant of how organisations work'* because it provided meaning for individuals seeking stability and predictability. He went on to define culture as:

> *"...the pattern of learned basic assumptions that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to the problems of survival and integration." (p.8)*

As early as 1961, a study of engineering firms by Burns and Stalker found that the typical response to environmental change was protection of existing business practices, to the extent of separating new ventures geographically and structurally from the established business of the firm. The changing circumstances threatened established power positions and status structures, prompting defensive action to protect this culture. The concept of a corporate culture was more widely popularised by Peters and Waterman (1982) in their world-wide bestseller, *In Search of Excellence*, in which they suggested that particular company values could have a direct impact upon organisational performance. Deal and Kennedy (1982) suggested that companies could 'manage' their cultures to increase business effectiveness. The inherent attractiveness of this idea precipitated one of the most popular management 'fads' of the 1980s, and analysis of organisational culture together with debates over whether culture can in fact be changed have since come to dominate modern studies of management.

The Japanese industrial organisation provides the most famous example of successful management of the often conflicting goals of flexibility and efficiency, within a distinctive and unique culture. Dore (1986) suggested that the Japanese success is based upon 'flexible rigidity', with emphasis upon vertical disintegration and highly organised, very effective inter-industry networks. This permits massive cost efficiencies, particularly in areas such as marketing. The Japanese culture encompasses what Ouchi (1980) categorised as 'clan management', or a reliance upon social controls and relationships of trust, rather than on self interest and economic necessities as in the bureaucratic model of management. (For a detailed analysis of the dimensions of differences between different national cultures see Hofstede 1984.)

Buchanan and Huczynski (1997) distinguished two distinct perspectives from the literature on the nature of culture in organisations. Firstly, they claimed that culture can be regarded as a 'variable' that is capable of changing as a result of management action, as described in the early research described above. In these terms, culture provides a sense of identity, commitment and solidarity for employees which reinforces the values of the organisation while allowing management to shape and control employee behaviour. Secondly, the authors identified a contrasting and deeper view of culture that regards it as indistinguishable from the organisation itself. By this they meant that culture both determines and is determined by social interaction within the organisation. The perspective recognises that a number of cultures may compete within one company, for example between management and staff or different functional groups, and that manipulation of culture to control behaviour may well be ineffective in such circumstances. The definition of culture provided by Morgan (1986) reflects its complexity according to this viewpoint:

> *"...the slogans, evocative language, symbols, stories, myths, ceremonies, rituals and patterns of tribal behaviour that decorate the surface of organisational life, merely give clues to the existence of a much deeper and all-pervasive system of meaning."* (p. 133)

It is clear from the above review that little consensus exists as to the nature of organisational culture. The next two sections of this chapter contribute to this debate by discussing the traditional banking culture, whether culture can be changed and how the analysis of the empirical data can add to our understanding of this contentious area.

THE TRADITIONAL BANKING CULTURE

Chapter 3 described how the traditional banking culture has become deeply entrenched in our society. Briefly, banking in the UK has evolved over the past 200 years into a highly specialist community. The industry has played a significant role in the changing fortunes of the UK economy because of its importance to the government as an instrument of monetary policy. Considerable emphasis has been placed on the development of a culture based upon tradition and stability. This image has been deliberately cultivated by the banks as it was seen to befit custodians of other peoples' money. The banks have grown rich on a historical money transmission monopoly, and have invested heavily in both electronic and paper based clearing mechanisms. Despite environmental changes in the form of increased competition, market deregulation and technological developments, the traditional structure, functions and priorities within the industry remain internally consistent and largely unaltered (Fincham et al 1994).

Similar findings were made by Child and Smith (1987) in their study of Cadbury Ltd which operated in a very different sector to the banks:

> *"Senior managers hold very similar constructs of the firm's operational dynamics which effectively furnish the rules of the game for the sector."* (p. 569)

This scenario can be explained by the work of Abernathy (1978), who noted how the characteristics of a specific industry sector were influential in shaping the development of a firm, to the extent that maturing sectors constrained the activities of the firms within them along increasingly similar lines. At the more micro level within

the component firms, Van Maanen and Schein (1979) emphasised the importance of *'organisational socialisation'* which ensures that newcomers absorb the appropriate company and industry values that are deemed normal and acceptable. They showed how the provision of a shared frame of reference across the sector results in the type of increasingly standardised behaviour described above.

Handy (1985) defined four distinct varieties of organisational culture that he described as 'power' 'role' 'task' and 'person' respectively. His notion of a role culture appears to fit well with the traditional banking culture, as it is dependent on rules, procedures, security and hierarchy of control. In common with the notion of the 'mechanistic' organisation identified by Burns and Stalker (1961), Handy noted the problems faced by role cultures in times of changing environmental conditions:

> *'Role cultures are slow to perceive the need for change and slow to change even if the need is seen. If the market, the product needs or the competitive environment changes, the role culture is likely to continue to forge straight ahead confident in its ability to shape the future in its own image.'* (p. 191)

This was certainly the case in Bank B, where attention was firmly focused on preservation of traditional business in the domestic market, created during an era of monopoly power which is no longer extant. Attempts to provide a payment service which crosses national boundaries still rely upon historical links with local banks in the countries concerned. Delays and double charging are endemic to this service, despite efforts by the European Commission and consumer groups to introduce quality standards. It was clear in Bank B that defensive strategies were fuelled by the prospect of losing commission income as new competitors undercut funds transfer prices and Monetary Union threatened to remove the need for currency exchange

within Europe. Radical change, however, would pose a threat to established career paths and power positions. There was little evidence in Bank B that technological developments were being utilised to pursue innovative methods of money transmission that could encompass a single European-wide payment system. While the technological capacity existed to devise more radical solutions, the project focused instead upon improvements in the quality and cost efficiency of existing services. One interviewee from Bank B described the situation as follows:

> *"The problem is much more of culture, than of technology. The problem is changing the philosophy, changing the way work is done and then using the technology to facilitate that, to underwrite the change. If no one is prepared to grab the bull by the horns in this way, then we will just make the same inefficient processes marginally more efficient. You may have some marginal incremental benefit, but if you do not change the way things are done and the way people think - radically - and support that with technology, then you are just going to have the same problems."* (Marketing Manager)

New entrants to the money transmission market are not encumbered by historical precedents and conservative organisational cultures. They have a more flexible approach because they are not compromised by vested interests in the maintenance of existing procedures and practices. An interviewee from Mondex (the company forms a good example of Handy's 'task' culture) summarised their approach as follows:

> *"We are pretty outward focused, as I guess we still have a lot to prove. This situation has created a sort of 'pioneer' mentality in the company - dogged*

determination if you like. We have neither the time or the inclination to mess around with political games and status symbols." (Marketing Manager)

The history of technical change provides many examples of organisations that have failed to utilise the potential offered by new technologies, and are eventually replaced by new market entrants, but the banks still do not appear to be taking this threat too seriously. The strategy of the newcomers seeks to combine technological capability with consumer needs, to create new market opportunities. For example, Microsoft and Visa International are jointly developing software which will facilitate electronic payment for goods and services available on the Internet, now a rapidly developing commercial market. A successful product could lead to the eventual exclusion of banks from the field of money transmission. Gates (1995) has made no secret of his belief that the convergence of money, commerce and personal computers represents one of the great new markets of modern times. Deregulation in the financial services industry has removed traditional barriers to market entry, and this trend looks set to continue with the growth of the Internet as a commercial medium. Building Societies and even supermarkets can now turn themselves into banks and offer a full range of financial products. Evidence does exist that this pressure is forcing the banks to be innovative and gradually come out of their historical and increasingly irrelevant introspective obsessions. For example, some interviewees acknowledged that their banks had missed out on the rapidly growing telephone banking business by initially dismissing the potential of the idea, allowing First Direct to build up significant market share. As a result, they are now determined not to be so complacent with regard to future new initiatives:

"I think they are more on the ball now. Deregulation of the market is forcing it, innovation by new entrants is forcing it. Computer banking is a massive

industry in the States, and will be over here. The banks were dismissive of telephone banking until recently, now they all have it. If a bank now does not have a telephone or internet service it will be a prime candidate for takeover. That attitude of 'we are the blue-blooded bankers and so don't need to worry about newcomers' is outdated and they cannot seriously sustain it any longer." (Industry Consultant)

Other interviewees also supported this argument:

"Banks which cannot cope in this more aggressive environment will either be forced out of business or taken over by a competitor - the level of competition is now too great to sustain the number of players in the market. I think there will be pockets of resistance at a middle manager level... those who have spent 25 years in a particular environment for example, and there are massive change management projects now underway to change that culture. I'm not saying it will be easy, and happen overnight, but it will have to be done." (General Manager, Bank C)

The issue of whether deeply entrenched cultures can in fact be changed is dealt with later in this chapter.

THE IMPACT OF CULTURE UPON TECHNOLOGICAL CHANGE

Many examples can be provided from the literature which illustrate the negative impact that inappropriate cultures can have upon technological change. Research in the commercial banking sector by Child and Loveridge (1990) was described in Chapter 6 in the context of structural constraints upon technological change. They

also noted the adverse impact that the *'national banking habit'* and the historical development of institutions within society had upon technological innovation in the institutions they studied. The authors claimed that banking cultures reflected a sober and predictable image which was intended to encourage customer confidence. At the same time, the desire to be seen as responsible custodians of wealth meant that the technological emphasis was placed upon preservation of managerial controls, at the expense of innovation.

Schein (1985) suggested that greater acceptance of technological change required a change in organisational culture, because practices and values were built around existing technologies which have contributed to the successful development and self image of the organisation. One of the strongest elements of culture he identified was the status system attached to these traditions, and the possession by individuals of critical skills. Schein claimed that innovation was a property of culture, and the potential of information technology as a competitive and strategic weapon would not be fulfilled unless innovative cultures were present or developed, enabling the organisation to learn and adapt. This attitude was also noted by Piore and Sabel (1984) whose theory of 'flexible specialisation' emerged from their observations that technological progress could be self-blocking, and new products were generally designed to fit existing equipment and procedures. The importance of culture was also emphasised in a study of video disk development by Graham (1986) who found that prevailing cultural values and attitudes in the firm, based upon past experience, were inadequate when it came to dealing with an innovative product in a new market.

Loveridge (1990) used examples from the banking industry to illustrate the problems inherent in the implementation of new technologies, without due attention to cultural factors. He found that the final form of the technology could be very different from

what was originally intended, and the process of rendering social hierarchies obsolete set up areas of conflict between old and new vested interests. He suggested that this *'automation of bureaucracy'* approach would constrain the potential of information technology in banking. Empirical research by Howells and Hine (1994) into the development of EFTPOS network technology, was described in Chapter 6 to illustrate the difficulties inherent in managing a new technology project within structural constraints. In addition, the authors found that the design of a single national network which would have benefited both banks and retailers was sabotaged by the inflexibility of the actors involved, who each exhibited different social, commercial, cultural and political agendas. This project provides another example of the issues of structure and culture overlapping to influence new technology implementation. Alternative bilateral arrangements were eventually established between individual banks and retailers, and the entire process cost the banks in excess of £120 million. The authors concluded that the cultural identities and particular knowledge bases of the banks involved were only suitable for managing their existing business, and this mitigated against the radical change necessary to create a new industry-wide network technology. By zealously guarding their traditional role and attempting to exclude newcomers from the clearing system, the banks tended to act as technological followers rather than leaders. This again raises questions about the capacity of the traditional banking industry to exploit technological advances in a proactive, strategic manner, and can be compared with the attitude towards European Payment system developments demonstrated in Bank B.

Zuboff (1988) argued that companies can pursue either an 'automating' or 'informating' approach to innovation in work practices and procedures, but only the latter adds value by introducing flexibility and job enrichment. She focused upon the

'informating' capacity of IT to transform organisational structures and processes, thereby introducing the flexibility, job enrichment and skill enhancement necessary to respond to increasing competition and rapid environmental changes. In practice, she noted that attempts to informate work processes at a Brazilian bank were inhibited by a culture of hierarchical authority, control and functional rigidity, and the result was a mere automation of existing processes. Staff became demotivated as the new technology introduced was designed to increase managerial control by replacing the skill and experience of individuals, rather than increase flexibility to meet the needs of a changing market. These findings are comparable with the UK research described above, where the defensive strategies of UK banks aimed to protect traditional business, with the technological focus upon cost savings and automation of existing processes. It can be argued that in this situation, the interpretative frames or cultural norms of the individuals shaping change in the banks give rise to particular interpretations in relation to the problems that the new technology was used to address. This means that the mode of solution preferred is influenced by the culture of the banks, leading to a tendency to favour 'automation' over 'information' in Zuboff's terms.

Interviewees from Bank C blamed the failure of the world-wide branch integration project upon the culture of complacency which existed within the organisation, based upon past success and prominent market position. Not only was the project a spectacular failure, but there seemed to be little concern within the company about the amount of money wasted, and no impetus to find out why it had gone so wrong. A rather flippant remark by one interviewee has a ring of truth in these circumstances:

> *"When the company is making profits in the billions then it does not really matter whether projects are successful or not! Save on matches and spend on champagne, that has always been our way." (Project Manager)*

The culture within the organisation was very conservative and change was resisted in day to day matters as well as in the implementation of large scale projects:

> *"The policy is there, you know, 'we welcome innovative ideas from our people', but you have to push very hard to get anything done. They were not prepared to let people try out their ideas, I mean some may not have worked, but others would have compensated. They had to be 110% sure it was a winner before they approved it, no one was prepared to take any risk." (Project Manager)*

> *"The failure of this project was very much typical of the organisation. It was good at responding to external customers when under pressure. But if there was more time in hand it was almost a rule that it would end up in political games. The culture of superiority goes right through the company, but the competitive situation is so different now, and we still cannot see it." (Marketing Manager)*

The situation was very similar in the case of Bank A. As described in Chapter 7, the interviewees attributed project failure to a lack of communication between business and IT areas, and a reluctance to appreciate and respond to changing market demands:

"One of the biggest things was the reluctance of the IT services department who actually run the systems to take on anything new. New systems were developed and ready for implementation but obstacles were put in their way to prevent them going live. For example, they complained about incomplete documentation, or lack of training etc. The staff are very old fashioned in their computing ideas, and they are after the job security of keeping what they know, so they see all these new systems as a threat." (Project Manager)

"The people in IT have been really obstructive. They no longer have a specialist knowledge base on which to justify their existence, as the users themselves are becoming increasingly expert and demanding. The culture in the bank is changing, and some people just cannot handle it." (Marketing Manager)

First Direct provides a more positive example as it demonstrates how innovation and change can be encouraged within a supportive culture. It would be easy to read too much into this success because First Direct has been isolated from the organisational environment of Midland Bank. In this case, a particular 'type' of culture has been deliberately engineered from a clean sheet of paper. It appears to have been successful, and there is now no obvious connection between the two organisations. As discussed in the previous chapter, despite the success of this project there has so far been little influence upon the traditional culture which still pertains within Midland Bank as a whole.

A change programme at Midland which was described in Chapter 7 and analysed by Morris and Westbrook (1996) was found to be successful precisely because it did not disrupt the prevailing management style and ways in which the staff had to work.

They were used to obeying instructions and changes were able to be incorporated into existing routines with little disruption. This study raises the question of whether a more radical change programme which challenged the accepted norms would have been so easily accomplished. Given the level of introspective behaviour in the industry, and the common need to cut costs, it is interesting that no attempt was made by the other banks to copy Midland's successful innovation. The authors explained this reticence by referring to the potential decline in importance of cheque clearing over time as the process is superseded by more modern payment methods, and also to the relatively lowly place occupied by Midland in the banking hierarchy, which rendered its innovations uninteresting in the eyes of its more successful competitors. Centralised cheque processing also represented a rather maverick move away from the accepted industry norms of collective management of routine transactions, and this added to the perceived unacceptability of such a project. Consequently, Midland has enjoyed a significant competitive advantage in terms of the cost savings and improvements to customer service introduced by their new system, without the usual rush by competitors to conform. The attitude of the other banks towards this successful project also illustrates the reluctance of the industry as a whole to cast aside traditional assumptions and accepted norms to embrace radical change.

This section has shown how the most successful banking innovations were either separated from the mainstream activities of the organisation, or were so incremental in nature that they did not disrupt existing business activities. More radical projects were compromised by restrictive cultural norms and values. The next section of this chapter considers whether it is possible for culture to be changed in these circumstances.

CAN CULTURE BE CHANGED?

A vast literature now exists on the subject of how to change culture. Mintzberg (1979) advocated the development of a culture of *'adhocracy'*, which is organic and decentralised in structure, thereby avoiding the pitfalls that are usually associated with bureaucracy. He claimed that such organisations minimise planning, control and the division of labour, in search of innovation. Harvey (1989) recommended vertical disintegration as a means of increasing flexibility, which shifted the emphasis from direct control within the organisation, to the creation and active management of networks of contractual relationships between firms. This approach allows the firm to specialise, with flexibility maintained at the industry level. Quinn (1992) argued that flexibility can be enhanced by a shift in emphasis from the management of business assets to the co-ordination of knowledge and intellect within the firm. Peters and Waterman (1982) advocated 'simultaneous loose-tight controls' that permit flexibility by avoiding bureaucratic constraints, but maintain control by means of shared cultural values throughout the organisation. Clark, Hayes and Lorenz (1985) recommended the reorganisation of management styles, philosophies and personnel with long term strategies in mind rather than immediate productivity gains.

In practice however, while examples do exist of individual companies, such as British Airways, that have 'created' a new corporate culture, (Brown 1995) these success stories appear to be few and far between. March and Simon (1994) in their revised edition of a seminal text which introduced the concept of 'bounded rationality' (referring to the limited cognition of organisational members), maintained that their theory still holds true today - despite the vastly increased resources available to the modern organisation, the authors believed that potential for change would always be constrained by the conflicting agendas of employees. As early as 1952, Lewin

identified three phases of culture change, namely *'unfreezing', 'change'* and *'refreezing'.* 'Unfreezing' results from questioning of norms which have led to a specific failure, thereby sensitising employees to the need for change, which is then consolidated into new procedures or behaviours during the 'refreezing' phase. As discussed in Chapter 2, this theory appears overly simplistic and linear in its classification of the technological change process, which appears invariably to be a more dynamic and turbulent series of events in practice.

Cressey (1992) argued that traditional banking culture actually helped incremental changes to be introduced, but the more fundamental change necessary to retain competitiveness in the future would be inhibited by these same characteristics. He found that when changes were introduced gradually in a piecemeal fashion, implementation was facilitated because employees were used to obeying instructions in a rule-based and paternalistic environment, and therefore put up little resistance to change. The author also noted the power of *'cultural baggage'* within UK banks to inhibit the business transformation made possible by technological developments, and deemed necessary to compete with industry newcomers. Despite the commercial incentive to change banking culture, the practical difficulties involved should not be underestimated.

Not all writers have treated the increasing popularity of using culture as a management tool with the same enthusiasm as its originators. Kotter and Heskett (1992) studied the relationship between organisational culture and the financial performance of large firms in a variety of industries, and found no direct correlation between business performance and a strong corporate culture. In addition, many of the organisations identified by Peters and Waterman as excellent in 1982 now no longer exist. Legge (1995) noted that strong cultures could be dysfunctional if they

prevented employees from looking beyond a rather narrow, inflexible view of the world and the role of the organisation within it. She found that the longer culture has been allowed to become entrenched within an organisation, the more widely shared and persistent the associated values and beliefs are likely to be. In contrast, a weak culture may be more adaptable to changing environmental conditions. Green (1994) also questioned the ability of organisations to manage culture in a prescriptive way:

> *'If culture could be levered into shape then, by now, someone would have discovered the method. The metaphors of fine-tuning and fit which abound in much of the literature on culture and strategy are altogether inappropriate for something as complex as human social systems.*" (p. 427)

He noted that while corporate cultures appear to be stable and static when studied at a particular point in time, applying a longitudinal perspective reveals that they are in fact too multi-dimensional and dynamic to be susceptible to manipulation by management.

The industry consultants interviewed were sceptical about both the capacity and commitment of the UK retail banks to instigate effective culture change because of the strength of their current market position:

> *"The ones that are going to be successful are the new entrants, or the ones that start from scratch, like First Direct. The reason that the big banks like Barclays will survive is because of their sheer size. I guess cultures can be changed eventually, but there could be a high social cost which might become unacceptable. These banks are just too big, and too protected, and can afford to lose a lot of money on IT projects. This situation may be*

changing with shareholder pressure, but most of those with any clout are themselves large institutions. Barclays for example, has one of the best returns on capital in the world, so there is little pressure from its shareholders to innovate. Even when they make massive provisions for bad debt, they can still pay dividends out of reserves, and the share price tends to be on a one way ticket upwards." (Industry Consultant)

Bank D has also been accused of complacency because its size and market position has led to good results, and hence there has been little pressure for innovation at the organisational level. The area of the bank which was studied has just gone through a downsizing exercise, and is now considered to be much further ahead in terms of new business practices than the rest of the bank. It provides an example of successful culture change, but can be compared to First Direct and Mondex in that the area benefited from its geographical and structural separation from the rest of the organisation. Consequently, the culture could be changed in the London office without impacting upon the company as a whole:

"We are now concentrating upon broadening people's experience rather than promoting them, and trying to wean people off the idea that you always need to get grade promotions. We try to pay them more for knowing more, and moving sideways within their grade to learn new skills. Giving grade increases tended to raise peoples expectations above the ability of the person. Sometimes those promotions reflected an individual manager's personal preferences rather than ability. So we try to pay people better for experience and knowledge." (Business Analyst)

"Our new policies have been accepted, because the people we are left with after the downsizing are more tolerant of change than some of their counterparts who have left. Those that wanted to stay for ever on one particular job, but expected promotion due to length of service... these are products of the old culture, and many of them have now gone." (General Manager)

"For me the main reason the culture could be changed was due to the way the process was managed, and the personality of the man at the top. If you have respect for somebody then you go along with their ideas, and get caught up in a wave of enthusiasm. This tends to mushroom if success is seen to be achieved. Admittedly, he was allowed a free rein to introduce changes, and was able to get rid of a lot of dead wood, which is not always possible. Certainly the bank as a whole is as ponderous as ever, but we seem to have hit a jackpot here." (Marketing Manager)

In summary, the data analysis supports the theory that culture can in fact be changed - at least within specific parts of the organisation - provided that the necessary commitment and authority is available. The management strategies employed at Bank D enabled the full potential of an innovative project to be realised, and the case provides practical guidance on the appropriate way for future initiatives to be managed. The other examples described in this chapter illustrate how rarely such conditions appear to be met, as specific aspects of a 'traditional banking culture' appeared to engender an attitude of complacency based upon past success that still appears to prevail in the industry. This can be manifested to sabotage organisational change and hence inhibit the potential of new technologies, as illustrated in the cases of Bank A, B and C. Such reticence therefore offers significant opportunity for new market entrants to challenge the traditional banking structure in the UK.

CONCLUSION

Analysis of the case studies resonates with Buchanan and Huczynski's claim (1997) that culture can be expressed at different levels, and whilst susceptible to change by management at one level, there are deeper aspects to culture which may be too firmly embedded to be manipulated in this way. For example, the observed preference to 'automate' rather than 'informate' when planning new technologies may well be a result of entrenched cultural norms defining and limitating the range of alternative solutions under consideration.

As newcomers to the banking market, First Direct and Mondex had a lot to prove and there was no scope for complacency. As both organisations were set up and run as separate entities from their founders, the task of deliberately creating a dynamic culture was greatly facilitated. It can be concluded therefore that the case studies contribute to understanding of the relationship between organisational culture and technological change in two ways. Firstly it has been shown how restrictive inappropriate cultures can be upon the implementation of new technology projects, and secondly that it is possible to change a prevailing culture in order to facilitate the change process. A longitudinal study is necessary in order to assess whether the changes instigated are sustainable over time and able to encompass other areas of the organisation.

CHAPTER 10 - DISCUSSION: THE NEED FOR ORGANISATIONAL LEARNING

INTRODUCTION

This chapter reviews the data analysis process followed in this thesis. It then considers to what extent such analysis has contributed to academic understanding of technological change in general, and the information technology productivity paradox in particular. It goes on to summarise the findings that emerged from the data analysis process described in Chapters 6 to 9, and pulls the analysis together by discussing the major issue to emerge from the study; namely, the need for organisational learning. The next section seeks to relate the analysis to ideas raised in the organisational learning literature. The chapter concludes from this that because the banks studied have made limited efforts to learn from past mistakes, and that even the lessons from successful projects are rarely disseminated throughout the organisation, the potential value of technological change projects continues to be compromised.

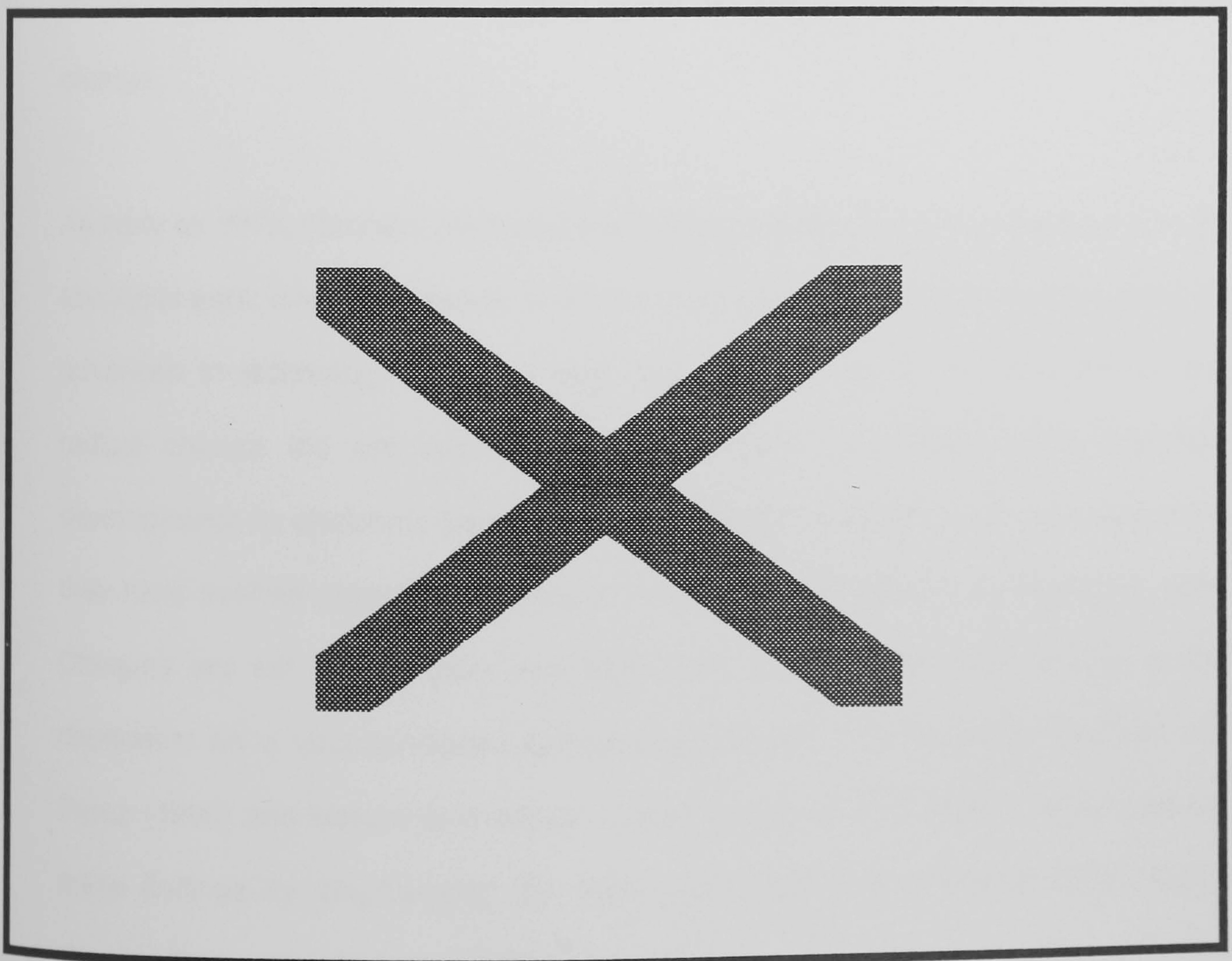
THE DATA ANALYSIS PROCESS

Grounded theoretical analysis of the case study material was undertaken in an attempt to draw out the contributory factors to specific project success or failure within the banks studied. The four major issues identified by this process were:

- organisational structure
- management of knowledge

- effective leadership
- organisational culture

These issues formed the subjects that were discussed in detail in Chapters 6 – 9 respectively. This chapter pulls together the findings from each of these areas and discusses the major theme to emerge from the study - the need for organisational learning if effective management of new technology projects is to occur. Figure 2 below summarises the analysis process followed in the context of the study as a whole:



MAJOR FINDINGS FROM THE EMPIRICAL RESEARCH

All of the case studies support the earlier work described in Chapter 2, which criticised the notion of technological determinism. In each example, technical problems with the new systems were insignificant in comparison with the organisational issues that compromised project progress. The findings here are in accordance with McLoughlin and Clark (1994), who claimed that while the actual 'technology' has some influence upon the nature of organisational change, it is only one of many interacting and complex factors. They concluded that effective introduction of new technology required a challenge to conventional prerogatives, and commitment from all levels of the organisation. Even then the new systems studied tended to evolve over a long period of time, rather than inspire immediate change.

As early as 1973, Flannery predicted the imminent demise of paper cheques and the circuitous bank clearing network, in favour of an electronic system made possible by advances in technology. We can now see with the benefit of hindsight that this radical change did not occur. While there have undoubtedly been important developments in electronic payment systems since Flannery's work was published, they have evolved alongside the paper based methods rather than replacing them. Cheques are still widely used and settlement in the credit card industry is still dependent on a voucher-based authorisation system. The work by Freeman and Perez (1988) and Nelson and Winter (1982) described in Chapter 2 also supports these findings by emphasising the slow and incremental nature of technological change. This suggests that although slow, the pace of change in the banks may still be sufficient to maintain their market position.

This evolutionary scenario contrasts with the work of Schumpeter described in Chapter 2 who predicted *'gales of destruction'* in which innovative products and processes would sweep aside obsolete industries and set up entirely new contexts in a disruptive, but ultimately beneficial fashion. It has been illustrated in this research that change on such a large scale has not yet been observed in the UK banking industry. The market is still dominated by the traditional players despite the considerable opportunities now offered by technological developments. Freeman and Perez (1988) argued of course that considerable time would be needed to allow for the structural and social adaptations necessary for full advantage to be taken of new technologies. During the transition they said there would be a period of strain, as the old social framework became increasingly dysfunctional. The authors claimed that the resulting system, once finally established, would differ significantly from earlier versions. In support of this theory, it could be argued that the limited steps the banks have taken to change the way they do business are evidence of a gradual transition that has yet to pay dividends. If this is the case, the examples from this study show that there is still a long way to go, and that a longitudinal study is necessary to investigate the issue.

Another scenario is that the banking market of the future could consist of entirely different organisations. Recent reports by financial service consultancies have highlighted the threat posed by Internet banking operators to the operations of the traditional banking oligopoly. They claim that banks are struggling to exploit the benefits of 'virtual banking' and stand to lose a substantial part of their business unless they adapt their processes and expand their product range. The developers of Mondex anticipate radical change of this nature and believe that precedent should not necessarily determine either the direction or the actual providers of new business practices. These organisations undoubtedly represent a potentially radical alternative

to existing banking services. Caution is clearly necessary in accepting these claims as parallels can be traced with the earlier excessive predictions as to the *'revolutionary impact'* of electronic banking.

Although the potential for IT to '*transform*' the banking industry has been heralded in the press for a number of years, this study has found no sign as yet that the UK banks are succumbing to the threat from new competitors. As noted by Dunne (1998), the banks are making record profits from their traditional business; share prices are at an all time high, and IT failures can be funded from reserves and are soon forgotten. It was also shown in Chapter 2 that while the publicity accorded to new banking technologies tended to generate high levels of awareness, but not necessarily a high degree of purchase. Even amongst the 'early-adopting' groups of customers, new products were bought to supplement rather than replace existing arrangements, (Brierley 1997).

To conclude this section, the extent to which the results of the empirical study resonate with the explanations of the IT productivity paradox described in Chapter 2 will be discussed. To do this, the six case studies were analysed against each of the ideas outlined in earlier chapters which have been put forward to explain the productivity paradox. The results can be summarised as follows:

REASON FOR EXISTENCE OF ITPP	BANK STUDIED
Lack of accountability and failure to address past mistakes	**Banks A, B and C**
Focus upon automation of established procedures within existing organisational structures	**Banks A, B and C**
Lack of consideration of the 'human' issues when new technologies are introduced	**Banks A, B and C**
Tendency to 'patch' together legacy systems to meet changing needs	**Banks A, B and C**
Development of radical innovations to replace existing services	**Bank D, First Direct, Mondex**

It was noted in Chapter 2 that studies which focus largely upon the measurement of changes in productivity are problematic because of the difficulty of isolating the effect of particular changes in quantitative terms, and also because such research provides little information about why productivity did or did not improve. This qualitative study has provided plenty of evidence of a lack of accountability for failure, poor human resource management, and a considerable degree of mismatch between technology and business strategy. The examples of Bank D, First Direct and Mondex can in one sense be regarded as successful 'informating' (Zuboff 1988). However, the study has also shown that the projects are less innovative than they might at first appear

because of their continued reliance upon the traditional structure of their parent companies for reasons of functionality or credibility. Each of these possible explanations for the productivity paradox will now be addressed in the context of the data analysis.

LACK OF ACCOUNTABILITY

In each of the 'failed' projects studied there was no attempt made to investigate the reasons for project failure with the intention of avoiding future repetition of the same problems. In Bank C, for example, a review was suggested, but the projected cost of £1 million was deemed too high. This figure was insignificant in comparison with the amount of money (some £300 million over a six year period) that had been wasted during implementation of the project. Interviewees from Bank C blamed the failure of the world-wide branch integration project on the culture of complacency which existed within the organisation, based on past success and prominent market position. Not only was the project a spectacular failure, but there seemed to be little concern within the company about the amount of money wasted, and no impetus to find out why it had gone so wrong. The same problems that had compromised the project were subsequently repeated because no effort was made to address the organisational factors that had contributed to project failure. The issue of blame played a significant role in the reluctance to address these factors:

> *"The review might well have pinpointed the finger at certain senior individuals who did not want to advertise their role in the failure of the project...so it was quietly swept under the carpet, and no organisational changes were made."*
>
> (Project Manager)

This scenario also applied in the case of Bank A, where a steering committee met once a month to check project progress. The review process was compromised by a fear that blame would be apportioned amongst certain individuals if too much emphasis was placed upon explaining the reasons for project failure.

In Chapter 8 it was described how the leader of Bank B's European Payment System project was also head of the department responsible for the bank's existing international payment operations. This meant that there was a direct conflict within his department between the need to meet performance targets - and hence qualify for bonus payments, which were based upon volumes of traditional payment business, and the task of developing and implementing a new service which would ultimately replace the existing methods. The large margins that the bank currently earns on international payment traffic would also disappear, and meant that even the project leader had no real incentive to make the project succeed. Some 6 years later, the vast majority of international transfers are still handled in the traditional manner. The same leader remains in place, and the slow progress has not been questioned within the bank. Pressure has been exerted by the European Commission to stimulate change, but there is little competitive threat within the industry as all the banks are continuing to profit from the status quo. The competition from industry newcomers is not yet considered viable enough within Bank B to disturb this rather complacent attitude.

These examples illustrate that lack of accountability was based partly on the attitude of complacency which had arisen in the banks from many years of good financial results and a strong market position at the organisational level, and partly upon the desire of individuals at all levels to avoid taking personal responsibility for project failure.

AUTOMATION WITHIN EXISTING STRUCTURES

There was little evidence in Bank B that technological developments were being utilised to pursue innovative methods of money transmission that could encompass a single European-wide payment system. While the technological capacity existed to devise more radical solutions, the project focused instead upon improvements in the quality and cost efficiency of existing services. In contrast, First Direct has been able to adopt a 'clean sheet' approach to system building and data management, as it is run as a separate entity from its parent bank. Interviewees identified First Direct's ability to customise its information technology to suit specific business needs as pivotal in establishing the new bank as a provider of quality service. In addition, First Direct offers customers the facilities of the Midland national branch network to withdraw cash or pay in cheques by linking the infrastructure of its proprietary computer system to that of its parent. As such, it provides an interesting example of innovation in the mode of service delivery operating in conjunction with traditional banking arrangements.

It was also noted in Chapter 5 that some US banks have taken this scenario further and are starting to operate 'parallel banks.' These are effectively new outlets starting with a clean sheet - that is, new technology and new staff - for the benefit of customers who expect 'state-of-the-art' banking facilities. The banks concerned run both their traditional and their new operations along side each other, rather than attempt to convert legacy systems and retrain existing staff to operate effectively in an entirely different culture and business environment.

With the exception of Bank D, the projects studied were either implemented within existing organisational structures, or separated entirely from day to day operations to avoid the difficulties associated with changing current arrangements. In Bank D the benefits of organisational change to support project implementation were evident, but the changes were not replicated in other areas. Research in the US banking industry by Dougherty and Hardy (1996) supported this finding. They found that remedies for solving innovation problems only had short-term value if the basic principles upon which the organisation was based remained unchanged, and that mature organisations were unable to sustain innovation over time because of an often overwhelming tendency to maintain organisational continuity.

LACK OF INTEGRATION BETWEEN TECHNOLOGY AND BUSINESS STRATEGY

In Bank A, the interviewees noted that there had been a more ready adoption of the new working practices by the business users than the IT department that developed the new technology. Indeed, the degree of resistance demonstrated by the IT staff had played a significant role in its eventual failure. Although such problems may have been anticipated in areas of the bank accustomed to a rule based and hierarchical culture, it might have been expected that people employed in a systems development role would be more accustomed to change. In practice, the business users across the bank could foresee the tangible benefits of systems integration as proposed by the project and were keen to progress. In contrast, the IT staff perceived a threat to established skill sets and power positions. Another major reason for project failure in Bank A was the lack of communication between business and IT areas at a strategic level. There was also a lack of appreciation of changing roles and priorities in an increasingly competitive market. Historically, the IT department had been used to dictating terms to the business for systems design and implementation, but as

business users became more IT literate, they regarded the systems area as just another supplier, and became far more demanding.

A similar situation occurred in Bank C where the IT area tried to retain its usual working practices and resisted the changes that project implementation would bring. In this case, although the business areas would benefit from the new technology, there were many different branches involved world-wide with differing interests and priorities. They failed to agree project priorities amongst themselves, and the individual in charge of the project lacked the authority to enforce consensus on either the system developers or the multifarious business users. The project leader had been seconded from another part of the bank and had no prior project management experience. This problem was compounded when he was moved on again to an unrelated role after completion of the project and his painfully accumulated experience was lost to the organisation.

In Chapter 8 it was described how the success of the electronic home banking project in Bank D could be largely attributed to the Managing Director, who had previously been the IT Director. This individual had the vision and the power to instigate major structural changes, allowing a closer working relationship between the business and IT areas to be built up. Divisions between business and IT areas in Bank D were reconciled by undertaking a 'business alignment programme.' The process involved analysis of the fit between the core businesses of the bank and the systems necessary to support this business. To get all the necessary staff working more closely together, people were physically removed from their roles within operating areas and given permanent roles as liaison officers in the IT area, while IT staff were transferred to fulfil similar roles in the relevant operating areas. This scenario contrasts sharply with the case of Bank C. The structural separation of

technical and business functions within different reporting lines ensured that there were no mechanisms in place to resolve conflicts between the two areas. The individual in charge therefore lacked the authority to instigate organisational changes or impose decisions upon participating areas, despite the strategic nature of the project.

'PATCHING' OF LEGACY SYSTEMS

Short cuts and existing system 'patching' were observed in both Bank A and Bank C when the project aims were scaled down over time as budgets and timescales were exceeded. In Bank B there was a deliberate policy of adopting existing systems to develop new services - in fact the capabilities of current systems were used to determine the characteristics of new services in order to keep costs to a minimum. This strategy reflected the reluctance of the bank to deviate from traditional (and profitable) methodologies despite customer demand and increasing competition. In contrast, First Direct and Mondex had no reason to patch existing systems when developing new services. This is because they were set up from scratch and had the considerable advantage of having no legacy systems to contend with. It was noted in Chapter 5, however, that banks rarely find themselves in this fortunate position because of their reliance upon historical systems for day to day operations that have to be supported alongside new developments. A degree of patching is therefore inevitable except in very rare cases. Additionally, care must be taken to ensure that today's innovative system is not tomorrow's legacy system, although current technological standards are converging as more attention is paid to issues of future compatibility and enhancement.

FOCUS UPON RADICAL INNOVATIONS

The point was made in Chapter 2 that it may be inappropriate to focus upon productivity improvements as a measure of successful new technology implementation, because organisations are now using IT to develop entirely products or services which fundamentally change the basis upon which they conduct their business. The examples of Bank D, First Direct, and Mondex appear at first sight to offer ample evidence of radical innovative activity in the UK retail banking sector. All the interviewees from Mondex were proud of the success that the company has so far achieved, and extolled the virtues of belonging to a dynamic and innovative organisation, which was inspired by the vision of its founders. They were less keen to admit that the Mondex brand has been developed largely on the strength of its links with established market players, particularly MasterCard.

Closer inspection of the other seemingly innovative projects reveals that the electronic banking system developed by Bank D remains localised to one small area of the bank, and the only innovative feature of the First Direct service lies in the delivery mechanisms that it employs. Otherwise, the banking services offered are identical to those of the traditional banks, and the bank relies upon Midland for access to the clearing system. First Direct customers wishing to pay in cheques or withdraw cash are also still dependent on the Midland branch network. Research has also shown that purchasers of innovative banking products are using them to supplement rather than replace their existing banking arrangements (Brierley 1997), and a longitudinal study is therefore necessary to address this issue fully.

In summary, therefore, the data analysis contributes to understanding of the technological change process and confirms the findings of earlier work that has

investigated possible reasons for the existence of the productivity paradox. It also supports the findings of earlier research described in this thesis which investigated the process of technological change management in the banking industry. For example, as with earlier work, it has been shown here that specific aspects of organisational structure, culture and management style tended to compromise the potential of the technological change projects studied. In consequence, the full potential of such new technologies was rarely realised. It was surprising that the same problems identified in the past were still recurring consistently in view of both the amount of resources the banks have invested in the projects, and the increasingly competitive nature of the market in which they are operating. The findings therefore raised questions about the apparent lack of learning from past mistakes, an issue that earlier work in this area has not focused upon. Discussion of this broader issue was incorporated into later interviews, and the results provide a different perspective on our understanding of how new technologies are managed within the banks. The next section of this chapter draws together the analysis in the previous chapters in terms of the perceived need for organisational learning if technological change projects are to be managed more effectively.

THE NEED FOR ORGANISATIONAL LEARNING

'RINGFENCING' LEARNING

Chapter 6 focused upon the influential role of organisational structure within the case study banks. The work builds upon the Burns and Stalker theories of 'mechanistic' and 'organic' structures by focusing upon the difficulties faced by the banks in attempting to change from one type of structure to the other. In order to facilitate such change, new projects were 'ringfenced' from mainstream operational activities.

The value of separating innovative projects was evident in the cases of First Direct, Mondex and to some extent Bank D, but at the same time it was noted that the projects continued to rely upon the parent institution. For example, although it is fashionable to condemn bureaucratic structures for restricting innovation, the success of First Direct appeared to owe more to the solid reputation of its parent, and also to the convenience of allowing customers access to the Midland branch network, than to the capabilities of the new technology the bank employed on a green-field site.

The internal "think tank" developed by Bank B was also ring-fenced from operational activities. It was charged with identifying industry trends and appropriate technological solutions, and provides yet another example of innovation in isolation from standard organisational practice. Such policies have obvious benefits for the individual project in terms of facilitating culture change by providing the ability to start with a clean sheet of paper. In each of the examples studied however, it seemed that the benefits of the organisational separation policy were restricted only to the particular project in question. This was because day to day activities within the banks were unaffected by the success of spin-off projects, as no specific systems were developed to encourage learning by integrating the new projects with existing operations. By ring-fencing the projects, the very opposite was actually the case. The success of Mondex and First Direct has yet to impact on Nat West and Midland in terms of the way in which each parent company is structured and managed. By restricting the opportunities to learn from successful projects, no ongoing commitment to innovation can be generated in the mainstream banking areas. This finding supports the work of Garvin (1993) who noted how the existence of such intra-company boundaries inhibited the flow of information, encouraged isolation and reinforced preconceptions. To recommend, therefore, that organisations transform

their structures from 'mechanistic' to 'organic' appears overly simplistic and something not easily achieved in practice.

LEARNING ACROSS DEPARTMENTS

The level of interaction between business and IT departments was also found to be a significant issue in the context of project success or failure. The literature review showed that this problem has been raised in numerous research projects going right back to the 1970s. Despite this, few of the banks studied had any systematic procedures in place to encourage communication and co-operation between these areas. Once again this indicates that little learning has taken place from earlier experiences. While interviewees from both Bank A and Bank C cited poor communication between the two areas as a major contributor to project failure, the successful project run by Bank D was characterised by a close relationship between all project participants. This situation was facilitated by the effective leadership of a manager with both systems and business experience. As the relationship between business and IT areas emerged as a major theme in all the cases studied, the issues surrounding business and technical expertise at the individual level were addressed in a separate chapter.

INSTITUTIONAL AND SOCIAL BARRIERS TO LEARNING

Chapter 7 described how the case study banks met considerable resistance to the changes in working practices and conditions that arose during the development and implementation of the new technology projects. Again, this was a common finding in the literature, but surprisingly the main source of resistance actually arose from within the bank IT departments themselves. This issue impacted adversely upon the

projects studied in Banks A, B and C, despite the attempts of the banks to build new knowledge structures and integrate business and IT functions where possible. Their strategies to encourage learning by transferring knowledge have involved experimentation with external recruitment, the breakdown of traditional grading structures and the development of new forms of expertise. In some cases, the potential for learning was compromised by entrenched social divisions between managers and workers that discouraged full and frank communication in either direction. Whilst these policies may not seem very radical in themselves, they represented a major break with tradition in some of the more conservative institutions studied. As such, they have been introduced with caution and in a piece-meal fashion, so it may be some time before the full impact of these changes upon the implementation of new technologies in the banks can be assessed. Certainly the policy was successful in the case of Bank D, but the changes were restricted only to the London office and have yet to be introduced in other parts of the bank.

LEADERSHIP AND LEARNING

In Chapter 8 the findings of earlier research into the role of visionary leaders at the organisational level were compared and contrasted with the results of the empirical study. The examples from the literature indicated that the effectiveness of such leaders in terms of the successful projects in which they were involved was considerable. The case study examples of First Direct (and to some extent Mondex) have been well publicised success stories, but the data analysis has shown here that their success cannot be wholly attributed to visionary leadership. For example, as shown above, heavyweight institutional backing has played a crucial role in securing customer acceptance of the new technologies. Bank B is one of the more conservative of the UK banks and not renowned for innovative leadership. Recent

advertising promotions have emphasised the importance of historical continuity, and the stated intention of the bank is to concentrate upon its traditional strengths. This policy was reflected in the failure of the leaders of the payment system project to pursue any innovative solution.

Analysis of the case studies indicated that innovative projects driven by visionary leaders tended to succeed despite adverse organisational conditions, rather than as a result of supportive organisational factors. Common problems faced by project managers included lack of access to necessary resources, and the receipt of only temporary support from senior management who did not rate innovation consistently on their list of priorities. The pressure to work within prevailing organisational systems tended to encourage conformity and stability. The heroic efforts of individuals could therefore result in a successful project on a one-off basis without engendering any lasting commitment to innovation within the company. Subsequent projects would therefore come up against exactly the same problems. This scenario occurred in the case of Bank C, where the lack of learning from project to project was emphasised by a policy of moving on project managers with accumulated experience. Newcomers who replaced them therefore faced exactly the same difficulties in running a new project.

From the evidence presented in Chapter 9 it can be concluded that culture plays an important role in the adoption and implementation of technological innovations. Specific aspects of a 'traditional banking culture' appeared to engender an attitude of complacency amongst the major players based upon historical success rather than commercial reality. This tended to reduce their perceived need to learn from past mistakes and hence inhibited the potential of new technologies, as illustrated in the cases of Bank A, B and C. Such reluctance offered significant opportunity for new

market entrants to challenge the traditional banking structure in the UK. As newcomers to the banking market, First Direct and Mondex had a lot to prove and there was no scope for complacency. As both organisations were set up and run as separate entities from their founders, the task of creating a dynamic culture was greatly facilitated. The example of Bank D showed that it was possible for culture to be changed within a traditional bank, albeit it only within a restricted area on this occasion. The case illustrated how the particular management strategies based upon teamwork and empowerment that were employed at Bank D enabled the full potential of the project to be realised.

To conclude this section, the major learning issues that emerged from analysis of the case studies are summarised below:

FACTORS COMPROMISING IT PROJECTS	**BANK STUDIED**
Reliance upon automation of existing procedures	Bank B
Lack of accountability for project failure	Banks A, B, and C
Complex and dysfunctional organisational structures	Banks A, B, and C
Lack of key IT and project management skills – poor management of expertise	Banks A, B, and C
Misalignment of technology and business strategy	Banks A, B, and C
A culture of complacency and resistance to change	Banks A, B, and C

Lack of learning from the mistakes of earlier projects	Banks A, and C
Friction and lack of integration between IT and business areas	Banks A, and C
Lessons learnt from successful projects not disseminated throughout organisation	Bank D, First Direct, Mondex

Despite these problems, the banks are making record profits and inroads into the market by industry newcomers are not yet significant. Enduring value is still attributed to the traditional banks in terms of their:

- reputation for integrity and safe-keeping of funds
- dominant market position and scale of reserves
- level of financial commitment to new projects
- customer inertia preventing large-scale defection to other service providers
- convenience to customers of nation-wide branch structures
- profitability of existing operations

These factors have contributed to the continuing market strength of the traditional banks in the UK, and time has therefore been allowed for the somewhat limited operating changes that they have instigated to gather momentum. For example, the following strategies were observed during the empirical study that facilitated project success:

FACTORS FACILITATING IT PROJECTS	BANK STUDIED
Using new technology to 'informate' rather than 'automate'	First Direct, Mondex, Bank D
'Ringfencing' new projects from the rest of the organisation	First Direct, Mondex, Banks B and D
Building links between business and IT areas	Bank D
Willingness of staff to accept change and learn new skills	Bank D
External recruitment policies to acquire new skills	Banks B and D, First Direct and Mondex
Cultivation of 'Power Users' and Internal Consultancies to generate knowledge and facilitate learning	Banks B and D, First Direct and Mondex
Ability to rely upon existing business structures and processes for new project success	First Direct and Mondex
Inspirational leadership	Bank D and First Direct

As discussed earlier in this chapter, these activities have resulted in specific project successes without generating commitment to technological innovation at the organisational level. For example, even the rapid growth and success of First Direct has not impacted upon mainstream banking within Midland Bank. Furthermore, First Direct's telephone banking service itself appears less innovative when its continued

reliance upon the branch infrastructure of Midland is considered. These issues tap into a broader set of ideas and concerns about organisational learning, and are discussed in the next section that examines the literature in this area. Such a synthesis of ideas may shed light on the lack of learning that was observed in the empirical cases.

THEORIES OF ORGANISATIONAL LEARNING

Senge (1990) described learning organisations as:

> *"...places where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together."* (p.1)

This definition appears over-idealistic and gives no guidance on the practicalities of encouraging organisational learning. Garvin (1993) also acknowledged the growing commercial imperative for learning, but noted that few companies explicitly encouraged learning in pursuit of competitive advantage. He defined the learning process as follows:

> *"A learning organisation is an organisation skilled at creating, acquiring, and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insights."* (p. 80)

Many other writers have noted the increasing need for organisational learning if companies are to compete effectively in rapidly changing markets, (see for example Whipp and Clark 1986, Jackson and McLoughlin 1997).

Theories of organisational learning help to show the relationship between learning processes and the form that learning takes. It is thus important to recognise that not all of what is learnt in organisations is done in an explicit and codified way. Huber (1996b), for instance distinguished three components; firstly, knowledge acquisition (which may be by means of experience, experimentation or acquisition); secondly information distribution (which can be facilitated by technologies such as databases or groupware) and thirdly organisational memory (which may be in the heads of employees or as written down rules and procedures).

One issue here is that the 'tacit' rather than the 'formal' elements of knowledge (see Chapter 7) are more difficult to transfer and retain. Nonaka and Takeuchi (1995) claimed that the conversion of tacit to explicit knowledge represented the most important element of organisational learning, and could be achieved by the promotion of 'knowledge networks' active at each of the acquisition, transfer and storing stages of learning described above. Argyris (1977) identified 'single-loop' learning as a scenario where decisions were based on prior experience without questioning the underlying norms upon which the original action had been taken. He claimed that this type of learning was inadequate for innovation, which instead relied upon 'double' or 'triple' loop learning where decisions were taken only after analysing the reasons why a particular strategy had been followed in the past. Jackson and McLoughlin (1997) suggested that conventional bureaucratic organisations such as banks rarely progressed beyond single loop learning, and Morgan (1986) suggested this was because different departments and hierarchical levels operated in a fragmented

fashion according to their own interests and goals. This finding is closely related to the concept of *'bounded rationality'* (March and Simon 1994) and this study has highlighted the attempts within the banks to overcome this constraint; by means of external recruitment and hybrid managers for example.

In Chapter 2 it was argued that insufficient time may not yet have been allowed for organisations to maximise the potential of new technologies. Historical examples were provided (Simon 1987 and David 1990) from other industries that illustrated the length of time necessary for new technologies to be fully accepted and integrated in preference to traditional and established methods. Both writers emphasised the need for an extended learning curve whenever radical changes to existing practices were proposed. Tidd et al (1997) showed how an organisation's existing knowledge base could constrain its capacity to exploit the opportunities presented by technological advances, because the learning process required would be 'path-dependent'. This meant that the new knowledge acquired would be strongly based on existing knowledge in order to reduce the perceived risk associated with the change. The more committed an organisation became to a chosen learning curve, the more difficult it would be to switch the learning process to a radically different area. This finding was observed in the case study banks and also builds upon the theoretical discussion of 'technological lock-in' in Chapter 2.

It can be argued that organisations need first to make mistakes in order to learn from them, and the banks studied in this thesis should therefore not be condemned too strongly for some of the errors they have made. However, the absence of learning from past mistakes was one of the more surprising issues to arise from this study. It meant that subsequent projects within a bank tended to come up against exactly the same problems as had been experienced earlier. The considerable resources

devoted to IT projects did not extend to measurement of the effectiveness of new systems, or analysis of why mistakes had occurred. This scenario was particularly applicable to Bank C, where the lack of learning from project to project was emphasised by a policy of moving on project leaders with accumulated experience. Newcomers who replaced them faced the same difficulties in running a new project. Bank D successfully implemented a new technology project, but the organisational changes that were introduced to facilitate the operation have yet to be replicated in other areas of the bank. In Chapter 8 it was shown that no individual project leader among the case study banks was able to instigate widespread organisational change that might prevent the same problems recurring in future projects. The policy of 'ringfencing' new IT projects has limited impact because the remainder of the organisation is unaffected by the change, and consequently has no opportunity to build upon project successes at the organisational level. Research in the US banking industry by Dougherty and Hardy (1996) supported this finding; they found that standard remedies put forward for solving innovation problems only had short term value if the basic principles upon which the organisation was based remained unchanged. In other words, they believed that such organisations could not sustain innovation over time because of often overwhelming tendencies to maintain organisational continuity.

Gulliver (1984) described the benefits that had accrued to British Petroleum as a result of implementing a 'Post-Project Appraisal Unit' (PPA) which was responsible for analysing completed projects within BP. The results of this review were disseminated throughout the organisation so that particular successes could be repeated elsewhere, and lessons learned from past mistakes:

> *"The PPA philosophy is that the company's investment performance will only improve as more BP people learn what went wrong and what went right in the past." (p. 454)*

The author noted that despite the obvious value of such a strategy, he had found few examples of companies that made even a cursory attempt to evaluate project performance after completion. Maidique and Zirger (1985) studied a large number of both failed and successful new products in the electronics industry and concluded that knowledge obtained by analysis of failure was often instrumental in achieving subsequent success. They described failure as *'the ultimate teacher'*. In one of the few examples of post-project appraisal found, Garvin (1993) described how Boeing introduced new policies to learn from mistakes after experiencing difficulties with the introduction of both the 737 and 747 aeroplanes. A high-level project team was appointed to compare the new product launches with earlier, more successful efforts to analyse where mistakes had been made. The group was charged with developing a set of *'lessons learned'* for the benefit of people involved in future product launches. Individuals who had worked on this appraisal team were then seconded to the 757 and 767 start-up teams to transfer the lessons learned to these new projects, both of which went on to be successfully launched. The scarcity of such success stories indicates that it is not only the banking industry that is failing to maximise the benefits of new technology, and a comparative study of IT project management in a variety of industries may provide valuable insights into this problem. This particular study has concentrated upon UK banks; future research that builds upon these findings and focuses upon comparing bank strategies for IT in a number of different countries may be of considerable value.

CONCLUSION

This chapter has shown that the individual projects studied provide some support for each of the theories put forward in Chapter 2 for the existence of the IT productivity paradox. The cases also contribute to the debate by considering the role played by organisational structure, knowledge management, leadership, culture and organisational learning in the management of new technology projects. Such detailed information would not have been obtained if the traditional quantitative method of studying the productivity paradox had been followed. The findings support the work of Wilson described in Chapter 2 who found little evidence of productivity improvements when new technologies were introduced in a number of industry sectors.

To summarise, the limited steps that the banks studied have taken to facilitate technological change have had some success at the individual project level, but have not yet instigated a more long term commitment to innovation and change throughout the organisation. According to many interviewees, this lack of learning from past experience is not regarded as a problem within the industry because the market position of the banks remains as strong as ever. Whether this position is sustainable over time is a question that can only be addressed by a longitudinal study. It can therefore be concluded from the analysis that this issue is contributing to the continued observance of the information technology productivity paradox.

CHAPTER 11 - CONCLUSIONS

INTRODUCTION

This short concluding chapter begins by summarising the reasons why new technology management in the banking industry was chosen as the subject of this thesis. It then assesses the findings in order to consider whether the study has addressed the specific research questions raised. Areas where further research is thought to be necessary are suggested, and also the extent to which the results of this study can be generalised to other industries. Finally, the implications of the findings are considered in the context of future success prospects for both the traditional banks and industry newcomers.

SUMMARY

The banking industry was considered to be an important example of technological change to study because of its position as the world's heaviest investor in new technology. The extent of the industry's domination of the market for new technology projects means that findings from an industry study also have a wider relevance in the context of technological change in the economy as a whole.

This thesis has studied the management of new technology projects within the banks in an attempt to find out why so many projects do not reach their full potential, despite the high levels of investment made and the acknowledged commercial imperative. It is becoming increasingly common to read in the press of how technology has the potential to 'transform' banking practice, but in reality the progress appears to be slow and incremental. New services have tended to be added to a bank's existing services rather than replace them, and they only become

integrated into mainstream banking practice over a period of many years. As indicated by the limited take up of the Mondex product to date, the use of cash as a payment mechanism has proved to be extremely durable despite the increasing variety of alternatives now available.

It was noted at the beginning of this thesis that conservative approaches to technological change offered significant opportunity for new market entrants to challenge the traditional banking structure in the UK. The degree of success experienced by newcomers such as First Direct and the supermarkets in a comparatively short period of time indicates that the banks are starting to lose market share to organisations that are able to offer new forms of banking service by utilising information technology more effectively. In such operating conditions, the business incentive to improve productivity within the traditional banks is considerable. However, there appeared to be little evidence of this in practice. The paradox between technological opportunity and business reality in the UK retail banks warranted further investigation and this issue formed the focus of the study.

ASSESSMENT OF FINDINGS

The thesis put forward in Chapter 2 was that the difficulty of translating technological opportunity into increased productivity centres upon the way in which new technology implementation is conceptualised and managed within adopting organisations, rather than upon technical failings. By contrasting the ways in which the retail banks and their new competitors approached the implementation of new technology projects, it was possible to identify a number of factors which were critical to the success or failure of each project studied. The findings from a number of projects recently implemented in a variety of traditional UK banking organisations and industry

newcomers were brought together in order to analyse the management issues in more detail. Six projects were studied in depth, with the background to the cases described in Chapter 5.

The analysis of the findings set out in Chapters 6 - 10 has shown that the way in which new technology projects in the case study banks were managed was indeed pivotal in shaping the implementation process and the eventual outcome achieved. This finding does not mean that all the projects studied were badly managed. On the contrary, many instances were noted where effective management facilitated and enhanced project success. Chapter 10 drew these findings together and concluded that the banks studied were unable to translate the learning taking place within individual projects into a systematic process that could be utilised at an organisational level for the benefit of the bank as a whole. Consequently, despite the amount of resources the banks have dedicated to information technology, the improvements made remain fragmented and transitory in nature.

This study has confirmed the findings of earlier work that has variously identified organisational structure, knowledge management, leadership and culture as critical issues in the management of new technology projects. It has also built upon these findings because previous research has focused upon the measurement of productivity changes rather than detailed qualitative analysis of a range of management processes, and hence has not paid the same attention to the vital issue of generating and disseminating organisational learning. It can therefore be contended that the study has contributed to the theoretical debate about the nature of technological change and the reasons for the continued existence of the productivity paradox, as well as provide practical guidance for managers on the successful implementation of future new technology projects.

CAN THE RESULTS BE GENERALISED TO OTHER INDUSTRIES?

As discussed in Chapter 4, it is dangerous to assume that the findings of an analysis of six case studies have a wider application in other situations. Even if a larger number of cases had been studied, the method does not allow 'proof' to be established in a statistically significant sense. However, the position of the financial services industry as the UK's leading investor in new technologies made it a particularly suitable arena in which to study technological change and the information technology productivity paradox. This means that the lessons learned may have relevance in a wider context than is usually provided by concentration upon one specific industry. It has also been argued in Chapter 2 that a qualitative study of contemporary cases can provide the rich detail necessary to illuminate the social and cultural influences upon technological change that are beyond the reach of a quantitative approach.

Care has been taken throughout the analysis process to compare the findings with those of previous research and to build upon existing theories where possible. Additional value can be obtained by drawing upon areas of literature (in this case technological change and organisational learning) that are usually studied in isolation. Theories of the nature of learning, of course, have a very broad currency. It is contended, therefore, that the study of technological change management in the banks can add to current knowledge of more generic issues of innovation theory and the management of innovation in practice.

Certainly, there are a number of precedents in other industries of the market situation currently experienced by the banks. Many historical studies of technological

competition discussed in Chapter 2 have shown that established market players tend not to come up with innovative ideas. Such research demonstrates that the usual response by industry incumbents to a threat from industry pioneers is further investment in existing technology - or, if new technology is employed, traditional business processes are imposed upon its use. Industry incumbents are then able to avoid the risks associated with early market and technical uncertainties by delaying major investment in the new technology until a later stage. The drawback of this strategy is that they tend to get left behind and consequently struggle to establish a viable market position in comparison with the more innovative pioneers who have hence been given time to build up the necessary skills. The parallels are such that future studies of technological change in the banking industry may well provide another example to add to this list which currently includes sailing ships, electro-mechanical calculators, typewriters and many others.

SUGGESTED AREAS OF FUTURE RESEARCH

This particular study has concentrated upon UK banks; future research that builds upon these findings, and focuses upon comparing bank strategies for IT in a number of different countries may be of considerable value. In Chapter 10 it was noted that research in other industries has also commonly reported on failures to maximise the benefits of new technology. The scarcity of success stories in this area indicates that a comparative study of IT project management in a variety of industries may provide valuable insights into the problem.

It has also been shown in this study that the limited steps the banks have taken to facilitate technological change have had some success at the individual project level, but have not yet instigated a longer term commitment to innovation and change

throughout the organisation. This lack of learning from past experience is not regarded as a problem within the industry because the market position of the banks remains strong. Whether this position is sustainable over time is a question that would make an interesting longitudinal study.

FUTURE PROSPECTS FOR THE BANKING INDUSTRY

To conclude the study, this final section reflects on what the results can tell us about the future make-up of the banking industry. At this stage it is still difficult to predict the likely extent of change in the industry structure. It is clear that the benefits to the consumer in terms of increased choice and efficiency are likely to be considerable. The historical review of the financial services industry in Chapter 3 showed how new services tended to evolve and integrate with existing ones over a period of many years. It is important to bear in mind the cautionary note described in Chapter 1 against the frequent tendency to exaggerate the potential of new technologies. Claims that technological advances will prove the demise of traditional banks may well be premature.

It was argued in earlier chapters that an 'anti-innovation' culture still prevails in the banks which encompasses the dealings that they have with both clients and their own staff. As a result, attempts to introduce radical changes in working practices based upon new communication technologies have so far been both belated and half-hearted. Bank customers also tend to mistrust radical change, as trials of Mondex and reaction to EMU have shown. Evidence has been put forward in earlier chapters which shows that the market position of the banks remains strong, but that the pressure from industry newcomers is forcing them to become more innovative. Steps have been taken by the banks to address some of the organisational issues

described in earlier chapters that have compromised IT projects in the past. It is clear from the empirical study that these changes have had a limited impact to date because innovation in a wider organisational context is not yet evident. Earlier research has also shown that technological change tends to be incremental in nature, is initially based upon existing routines, and the social changes associated with new technology implementation take a considerable amount of time to filter through the system.

In contrast to the traditional banks, organisations such as Mondex and First Direct tend to be free of the costs of maintaining extensive branch networks and complex legacy computer systems and they are not constrained by vested interests in maintaining existing technologies. Furthermore, despite current scepticism, the acceptance of telephone banking or electronic cash requires a leap of faith by the consumer which is not unprecedented. Many financial transactions today are only represented by numbers on bank statements, and over a lengthy period of time it became acceptable to receive coins in exchange for goods, then paper cheques instead of coins, and even automatic bank transfers instead of cheques. It has also been noted in this study that supposedly innovative ideas are often supported by mainstream industry incumbents; certainly the innovative projects studied here relied upon their links with established market players for customer acceptance. On this basis, it would appear that the prospects for acceptance of new banking technologies over the longer term are good, but they will operate under the remit of the existing market leaders who will continue to dominate the industry for the foreseeable future.

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