THE IMPACT OF ORGANISATIONAL CHANGE ON THE ROLE OF THE SYSTEMS ANALYST

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PH.D. THESIS

UNIVERSITY OF WARWICK

1996

This thesis is dedicated to my mother, Alice Joan Flynn, for all the support she has given me. God bless.

ACKNOWLEDGEMENTS

Many people have contributed to this research and I am very grateful to all of them. In particular, I must extend my appreciation to the systems analysts and managers who so generously gave up their time to help me carry out the fieldwork.

I would also like to acknowledge the support of my colleagues and my family, particularly my mother.

Finally, a very special thank you must go to my supervisors, Professor Galliers and Dr Harry Scarbrough, for their guidance throughout my registration.

ABSTRACT

A major theme in the IS literature in recent years has been the dramatic impact of changes in technology and the business environment on the roles and skills of IS professionals. The British Computer Society (BCS) and other authorities suggest that roles are becoming broader and that demand is growing for a new breed of hybrid managers who possess a wide range of technical, business and organisational competences.

Although it is recognised that there are constraints on developing hybrids, little research has been carried out on the nature of these constraints or on the impact of organisational change on IS roles. It was to fill this gap in the literature, and provide data that would be of value to practising managers, that the research presented in this thesis was undertaken.

The main aims of the research were: (i) To explore the impact of change on the roles of a group of systems analysts; (ii) to examine the systems analysts' perception of the effects of change on their role and (iii) to determine whether there were any factors impeding the hybridisation of the analyst's role. Analysts were selected as the focal group for many reasons but mainly that their role requires hybrid competences and they would therefore be a good group to examine the strength of the forces for/against change.

The decision to focus on the analysts' perceptions was to gauge individual reactions to change. Since the individual's perception of events is likely to influence their behaviour, it was reasoned that if the analysts' perceived change to have negative consequences, their attitude may be a constraint on hybridisation and on organisational change. It would therefore be of

practical value to gain a clearer understanding of the analysts' view of the change process.

The case study approach was used to examine the impact of change on the analyst's role. Although other methods could have been used, the case study would permit detailed analysis of the process of organisational change and provide an effective means of accessing the analysts' perceptions of the impact of change. The research was carried out in five organisations: three in the financial services sector and two in the retail sector. The decision to base the research in a number of companies and different sectors was to examine differences between organisations and to illuminate the impact of contextual factors.

Financial services and retail organisations were considered an appropriate choice for the research because they tend to rely heavily on IT and have been subject to very rapid sectoral change over the last few years. The BCS maintains that these are the conditions in which hybrid managers are most likely to emerge. If the organisations selected fulfilled the Society's criteria and the roles of the analysts were technically defined, this would point to constraints on hybridisation.

To analyse the impact of organisational change on roles a theoretical framework was developed which identified the factors that influence roles and explained the dynamics of the change process. A distinction was drawn between factors in the outer context (macro-environmental, sectoral and occupational factors) and the inner context (the organisation and individual role encumbents). These factors were reconfigured in terms of Lewin's fields of force model to suggest how organisational change and change in roles may come about.

Thirty-five systems analysts took part in the research. The impact of change was examined over a period of six years (1989-1995), the average length of the analysts' tenure in the participating companies. Data was collected using a variety of methods, including a self-administered questionnaire, interviews with analysts and their IS and Personnel Managers and examination of company documents.

In spite of the dramatic changes that had taken place in the case study organisations, the findings reveal that three continued to define the analyst's role in technical terms. Two had broadened the roles of the analysts but there were still constraints on the extent of change. These constraints included the structure and culture of the organisation, the strategies for managing the IS department/division, the emergence of new occupational groups and the analyst's own orientation to their role.

The research suggests that the impact of change on the analyst's role may vary between organisations and reflect the influence of contextual factors; that dramatic organisational change does not necessarily create conditions that are conducive to developing hybrids and that there may be significant constraints on bringing about change in the analyst's role.

The thesis provides empirical data on the impact of change on roles and helps to explain some of the reasons companies may be experiencing difficulty developing hybrids. Although it helps to fill a gap in the IS literature, it is suggested that more contextual/interpretive studies are needed on the constraints on hybridisation in different organisations and on different occupational groups.

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CHAPTER ONE
Introduction

1.0 Outline of the Chapter

This Chapter explains the subject-matter of the thesis and presents the theoretical background to the research that was undertaken. It begins by reviewing the literature on roles and skills in IS and suggests that a key theme has been the need to develop IS professionals with a wider range of competences. Although there are organisational constraints on this process, the review shows that little is known about the nature of these constraints, their effect on roles or, indeed, the impact of organisational change on roles. It was to fill this gap in the literature that the research outlined in the Chapter was carried out.

As there is no "theory" of the change process in IS roles, the Chapter presents a model which identifies the environmental, organisational and individual factors that influence roles. Lewin's fields of force model is adapted to explain the dynamics of the change process and constraints on change in roles (Lewin, 1952). The final part of the Chapter explains how this model could assist in interpreting the findings of research on the impact of organisational change on the roles of a group of systems analysts employed in five large private sector companies.

1.1 Introduction

A major theme in the IS literature in recent years has been the need to develop IS professionals with a broader range of competences. Keen (1988), for example, argues that IS professionals require both technical and business

skills if organisations are to exploit the competitive advantages of IT. The British Computer Society (BCS) takes this argument a stage further in a report which claims that demand is growing for a "new breed" of hybrid managers who possess the technical competence, organisational skills and business acumen to "conceive and implement, in the line organisation, systems that will win global customers and beat global competitors" (BCS, 1990). Reports by City University (1991) and West London TEC (1993) provide further evidence of a growth in demand for IS professionals with technical, business and management skills.

In all these publications, attention is drawn to the organisational constraints on change. The BCS's report, for example, points out that the structure and culture of many large organisations may inhibit the development of hybrid managers (BCS, 1990). City University's report identifies the structure and culture of organisations as a constraint on change and urges managers to introduce more flexible career systems (City University, 1991). Keen (1988) also highlights the need for changes in the career system, suggesting that managers rotate IS professionals to give them greater exposure to the business.

Although there is concern about constraints on change in IS roles little research has been carried out in this area. The only empirical data comes from research by Carol Brooke as part of City University's study of changing roles and skills in City institutions (Brooke, 1991). Brooke's research reveals how change in the roles of analyst/programmers at two of the companies that took part in the study was impeded by organisational factors. At one of the companies the drive to introduce Total Quality Management, for example, was frustrated by "the perceptual gap between the cultural beliefs of management and those of staff at lower levels". These cultural beliefs were

reflected in management perceptions of analysts and programmers and in opportunities for career advancement. Management believed that technical staff preferred promotion into technical roles, thus preventing many from moving into management jobs.

Brooke's findings clearly suggest that there are powerful constraints on change arising from the organisational context. Her aim in carrying out the research, however, was to develop a methodology for examining the process of change in organisations rather than constraints on change in roles. Consequently, the investigation does not provide a detailed analysis of the constraints on change in roles or, indeed, the impact of organisational change on roles. Research in this area is needed both to develop a better understanding of the potential obstacles to change in IS roles and, more generally, to illuminate the process of change in roles. It was to fill this gap in the IS literature, and provide data that would be of value to practising managers, that the research presented in this thesis undertaken.

The research had three main aims:

(1) to explore the impact of organisational change on the roles of a group of systems analysts;

(2) to examine the systems analysts' perception of the effects of change on their role;

(3) to determine whether there were any factors that impeded the hybridisation of the analyst's role.

The decision to focus on systems analysts and constraints on hybridisation was prompted by the growth of interest in developing hybrid managers. By examining organisational constraints on the skills of a group whose role requires hybrid competences, the research would provide empirical data on an area that is of major importance but still under-researched [1].

The research examined the impact of change from the analysts' perspective to gauge individual reactions to change. Clearly, if the analysts had a negative attitude to change, this may influence their willingness to co-operate with management and could be a constraint on hybridisation. The assumption that the analysts' perceptions are important is supported by Symbolic Interactionist and Interpretivist theories which stress the role of the individual in moulding their environment (Fondas and Stewart, 1990; Walsham, 1993). A further reason for focussing on perceptions was that IS professionals' views on their role and attitudes to change have received little attention in the IS literature. Brooke's research is unusual in that it considers how IS professionals actually feel about the process of change (Brooke, 1991). By examining the impact of change from the analysts' perspective the research would help to redress this imbalace in the literature and provide valuable insights into some of the factors that may influence their behaviour.

The research was carried out in five companies - three in the financial services sector and two in the retailing sector and involved thirty-five systems analysts and their IS and Personnel Managers. The impact of organisational change was examined over a six year period (1989-1995), the average length of time the analysts had spent with their current employer. The reason for basing the research in five organisations and two sectors was partly to examine differences between organisations and partly to highlight the impact of contextual factors on the cases studied. Contingency theory, described in

more detail later, suggests that there would be differences between organisations in terms of the impact of change on roles because no two organisations are exactly alike. Contextualism, also described in more detail later, argues that an understanding of the impact of change requires an understanding of the context in which it takes place. Since the impact of contextual factors in one organisation is best illustrated by comparing it with others, it would clearly be useful to include a number of organisations in the research.

The companies that took part in the research needed to fulfil certain criteria, i.e. they had to be large, IT intensive and must have experienced a period of very rapid or dramatic change over the last few years. Organisations in the financial services and retailing sectors appeared to satisfy all these criteria, particularly the latter. It was important that the companies had experienced very rapid or dramatic change partly because this would help to illuminate the effects of change on roles and partly because the BCS argues that hybrids are most likely to emerge just before or during periods of rapid organisational change or when there is a "crisis" within the organisation (BCS, 1990). If the companies that took part in the research had experienced rapid/dramatic change and the analyst's role remained technically defined, this may point to constraints on hybridisation.

Before carrying out the research it was necessary to develop a theoretical framework that could be used to interpret the findings. A review of the IS literature revealed that there is only one theory which examines the factors that lead to change in roles - the Stages of Growth Hypothesis. The latter divides computer systems development into a number of stages, each of which is characterised by changes in the use of IT (Gibson and Nolan, 1974; Rockhart, 1988). According to stage theorists, changes in the use of

technology result in changes in the roles of IS professionals. As technology becomes easier to use and penetrates deeper into organisations, the roles of IS professionals become broader and more focused on the business (Nolan, 1973; Rockhart, 1988).

The Stages of Growth Hypothesisis was rejected as a basis for the research because (a) the strong emphasis on technological drivers of change tends to obscure other factors that may be important in the change process (b) there is some doubt about whether organisations pass through the stages described and (c) the assumption that organisations respond in similar ways to pressures for change implies that roles also change in similar ways, thus ignoring the diversity which exists between organisations and the different ways roles may change in response to organisational change. With regard to the first point, a number of writers, including Friedman and Cornford (1989) have suggested that the Hypothesis overstates the technological determinants of change. Benbasat et al (1984) reviewed the research that had been conducted on the Stages of Growth Hypothesis and concluded that there was no firm evidence to link changes in technology with the stages of growth identified, thus casting doubt on the assumption that technology is the main causal factor in change and that organisations pass through the various stages identified. The one piece of research that investigated the relationship between stages of growth, changes in the use of technology and changes in the role and skill profile of IS professionals, failed to support the main predictions of the Hypothesis (Benbasat et al, 1980).

If the Stages of Growth Hypothesis was not an appropriate basis for the research, what other framework could be used to assist in interpreting the impact of organisational change? A way of conceptualising the change process may perhaps be to focus elements in the internal and external

environment that influence roles [2]. The internal environment would include different aspects of the organisation and the people it employs; the external environment would include all those forces that exist outside the organisation that exert an influence on it. Change in either the internal or external environment may bring about change in roles.

Support for the contention that internal and external factors bring about change in roles can be found in a number of theories, including Contextualism, Contingency Theory, Symbolic Interactionism and General Systems Theory. As suggested earlier, Contextualism is based on the idea that there are differences between organisations and that an understanding of the effects of change depends on an understanding of the context in which change takes place (Dawson, 1994). The context of change usually embraces both the internal and external environment of the organisation. Whipp et al (1987), for example, distinguish two contextual levels at which strategic change may occur: the inner context, which includes aspects of the organisation such as its culture, structure, political processes, etc. and the outer context - the political, economic, social and technical environment. The results of this study and research undertaken by Child and Smith (1987) and Clark et al (1988) and other contextualists suggests that an understanding of the effects of change requires an understanding of the context and the relationships between the external and internal environment.

Like Contextualism, Contingency Theory suggests that the impact of change is likely to vary between organisations and reflect the specific features of the situation or context (Mintzberg,1979, Morgan, 1986). These features include the internal environment - the tasks of the organisation and the individuals employed to carry out those tasks and the external environment - all the forces outside the organisation that exert an influence on it. According to

Contingency Theorists, the role of management is to ensure the optimum fit between these elements. The optimum fit is contingent on the context (Mintzberg, 1979, Morgan, 1986). Change in the context will influence the tasks of the organisation and, by implication, the roles of individuals.

The third theory that can be used to support the importance of different *internal* forces on roles, Symbolic Interactionism, was referred to in the discussion of aims. Symbolic Interactionism emphasises the interaction of the individual and the social situation in role formation, enactment and development. Interactionists suggest that the way an individual behaves is largely a reflection of their internal expectations regarding their position. These internal expectations arise from the individual's experience of interacting with people in other roles. This interaction causes them to test their understanding of these roles and as a result to maintain or modify their own role behaviour. Instead of simply reacting to the social environment, therefore, interactionists suggest that individuals actively create it (Fondas and Stewart, 1990). According to this perspective, it is the interaction of the individual with the organisation that brings about change in roles.

The final theory which suggests that change in roles may be the result of external and internal influences is General Systems Theory. The latter suggests that an organism can be viewed as a system made up of interdependent parts and that change in one part of the system will bring about change in other parts of the system (Bertalanaffy, 1971; Jackson, 1991). As organisations are "open systems", i.e. able to receive inputs and make outputs, it follows that changes in the external environment may bring about changes in the organisation. The organisation also consists of interdependent parts or sub-systems; so change in one part of the system, resulting from external or internal pressures, is likely to bring about change in other sub-

systems. Since these subsystems are made up of interrelated sets of roles, change in any of the subsystems may bring about change in roles and change in roles of one sub-system may bring about change in that sub-system, other sub-systems and the functioning of the organisation as a whole (Parsons et al, 1951, Jackson, 1971). Any major change in the latter may influence the broader socal system, i.e. the external environment.

If it is accepted that change in roles is influenced by the factors in the internal and external environment, it is important to identify these factors and highlight some of the relationships between them. Section 1.4 describes the organisational, individual and environmental factors that influence the way roles are defined and developed. The distiction Whipp et al (1987) drew between the inner and outer context was found useful in this respect. The inner context was deemed to include both organisational and individual factors. The outer context included factors in the external environment, including political, economic, social and technical events and sectoral and occupational changes. Section 1.5 takes the analysis one stage further by examining the dynamics of the change process. Lewin's fields of force model is adapted to explain the way change in roles is effected and the potential constraints on change (Lewin, 1952). Section 1.6 suggests how the factors identified in 1.5 may be reconfigured in terms of Lewin's model to explain the forces driving and constraining change in roles. To place the discussion of roles and organisational change in context, Section 1.2 defines the concept of role and Section 1.3 defines the concept of organisation.

1.2 The Concept of Role

The concept of "role" is regarded as one of the most important in the social science and management literature and also one of the most difficult to define.

The point can best be illustrated by giving some examples of how role has been defined:

> *... role is a pattern or type of social behavior which seems situationally appropriate to the individual in terms of the demands and expectations of those in his group.*
>
> (Sargent, 1951, p.360) [3]

> *Role ... draws our attention to any behaviour regularly emitted by the occupant of a position ... it describes the rights and obligations which are inherent in the occupancy of a social position, the norms and moral rules which define the behaviour that you are entitled to receive from your role partners and that you should engage in with them.*
>
> (Bradbury, Heading and Hollis, 1972, pp. 41-42)

> *Role is ... the ways of behaving which are expected of any individual who occupies a certain position.*
>
> Newcomb [4]

Although there are common elements in these definitions, i.e. role is seen as a pattern of behaviour which reflects the expectations associated with a particular position, the words used to describe the concept are extremely vague. A "pattern of behaviour", for example, can cover any number of activities, many of which may be quite trivial (Bradbury, Heading and Hollis, 1972). The word "expectations" to describe the forces that shape behaviour also presents problems. It is not clear whose expectations should be considered: broader society, the immediate family, colleagues, etc? Are the expectations held by others more or less important than one's own expectations? Functionalist theorists would argue that the former is more important since it is in the organisation's interest to maintain tight control over the individual's behaviour (Ruddock, 1969). Symbolic Interactionists

would reject this argument on grounds that it assumes that the individual passively responds to change (Fondas and Stewart, 1990).

Apart from the imprecision of the terms used in defining role, there is the problem of distinguishing role from related concepts such as position and status. In the above quotations, role was seen to arise from a position. For many writers position is ... "a location of an actor or class of actors in a system of social relationships" (Gross, Mason and McEachern, 1958). It differs from status in that the latter implies a definite social ranking. In the academic literature, however, these terms are often used interchangeably. Broom et al, (1980) for example, describe a "social status" as a position in a social system and role as the behaviour that is associated with a given status.

One of the ways of dealing with the semantic confusion surrounding role is to break up the concept into component parts that are interrelated but can be analysed separately. Levison (1969) has identified the following three components of role:

1. Role consists of the structurally given demands associated with a particular position. "Role is, in this sense, something outside the individual, a set of pressures and facilitations that channel, guide, impede, support his functioning in the organisation".

2. Role consists of the individual's inner beliefs about how someone in their position should behave. Thus role is the individual's "orientation or conception of the part he is to play".

3. Role consists of the patterns of behaviour associated with a particular position and the relevance of this behaviour in terms of the social structure.

"Role refers to the ways in which members of a position act in accord with or in violation of a set of organisational norms".

Levinson's approach directs attention to the social and psychological elements of the role concept and provides a starting point for examining roles empirically. The definition focuses attention on how someone occupying a particular position is expected to behave; how that person believes they ought to behave and how they behave in reality.

Although breaking the concept down in this way helps to make it more manageable, the problem of developing operational definitions of the terms employed remains. To go back to the question raised earlier, whose expectations are important? In the context of the present research it would seem sensible to focus on those who will influence the individual's role directly, i.e, "significant" others (Berger and Luckman, 1966). The other problem with regard to defining role, i.e. determining relevant "patterns of behaviour" may be overcome by focusing on the tasks the individual carries out on a regular basis and the knowledge and skills necessary to carry out those tasks.

Levinson's tripartite definition of role forms the basis of the definition of role used in this thesis. Chapter Five discusses the analyst's role in terms of the tasks and responsibilities associated with the position of analyst as well as the knowledge and skills necessary to carry out the role. In addition, the Chapter considers the organisations' definition of the analyst's role as reflected in the sample of analysts selected by management. The analysts' own internal expectations of their role are reflected in their accounts of the tasks and duties they perform, the competences needed to carry out their tasks and the main sources of satisfaction in their job. Chapter Five also examines the position of

the analyst in the organisation and the status associated with their position. Chapter Six presents data on the expectations of the analyst's role held by "significant others" and considers how these have helped to influence the role and determine the direction of change. The outcome of different expectations that are held of the role in terms of the change management process are discussed in Chapter Six.

1.3 The Concept of Organisation

An organisation has traditionally been defined as a place where people with particular skills are employed to perform various tasks that, taken together, lead to the accomplishment of certain goals, e.g. making a product or providing a service. The key characteristics of an organisation according to this perspective are that it is (a) located in a physical space, usually a building or group of buildings; (b) there is a clear boundary around the organisation that separates it from other organisations and the environment; (c) the work carried out within the organisation is divided into discrete areas, often called departments or divisions, around which there is also a boundary; (d) tasks are broken down into the smallest possible unit and carried out by people with specialist skills; (e) the work is planned, organised, controlled and monitored by managers who are part of a chain of command that extends to the most senior appointment in the organisation (Taylor, 1947; Weber, 1947; Fayol, 1949).

Although the above characteristics still describe many organisations, changes in the political, economic, social and technical environment have eroded the traditional concept of the organisation. The assumption that an organisation can be defined at least partly by the physical space it occupies, for example, is no longer valid. Developments in telecommunications mean that it is possible

for many people to work from home and for services to be provided remotely, thereby enabling organisations to reduce overheads and increase flexibility (Huws, 1994). It is also no longer possible to draw a clear boundary around the organisation and to divide it into separate functional or product areas. The move towards colloborative working arrangements and the growing number of companies that are developing products which "can be made available at any time, in any place and in any variety" is leading to the emergence of a new kind of organisation: a "virtual corporation" that is "almost edgeless with permeable and continuously changing interfaces between company, supplier and customers" (Davidow and Malone, 1992).

The emergence of this "new type of organisation" is altering the roles and skill profile of staff. Whereas the practice used to be to develop functional specialists, Kanter (1989) Davidow and Malone (1992), Lorange and Roos (1992) and others argue that employees increasingly need skills in more than one area to exploit new ideas and technologies and to work in colloboration with their "partners" inside and outside the organisation. Changes in the internal structure of organisations and in the roles of staff are reducing status differentials, another feature of "traditional" organisation. As organisations downsize in a bid to reduce costs and increase flexibility, the onus is on staff, individually and in teams, to manage their own work (Koch and Godden, 1996). The growing demand for more highly skilled staff and the trend towards teleworking is also increasing the importance of self-management [5]. Although this does not mean that the chain of command has disappeared, the trend is to use more informal means of control (Woolridge, 1995).

In light of these changes, how is the modern organisation to be defined? An organisation may still be defined as a social unit which exercises control to accomplish particular goals but the precise form the organisation takes, that

is, its structure, is likely to vary enormously. Thus, while some organisations are likely to display the characteristics of Davidow and Malone's "virtual corporation" others are more likely to resemble Taylor's Bethlehem steel plant (Davidow and Malone, 1992; Taylor, 1947). The assumption that organisational structure varies according to the situation is consistent with contextual and contingency approaches to change described earlier and provides a useful basis for making comparisons between companies in terms of the role and skill profile of IS professionals.

1.4. Factors Influencing Roles

Having discussed the concepts of role and organisation, it is possible to consider the factors that influence the way roles are defined and developed. This section examines factors in the inner context that influence roles.

1.4.1 The Inner Context

1.4.1.1 General Attributes of the Organisation

One of the most important factors influencing the role and skill profile of IS professionals is the type of business or service the organisation provides (Mumford, 1972). The roles of IS professionals working in a financial services company, for example, are likely to differ from those in a catering establishment, both because they will be using different systems and because IT may be more crucial to the survival of the financial services organisation. In organisations where IT is critical to the organisation's success, the IS function may occupy a higher status and there may more emphasis on career development for IS professionals.

The size of the organisation is another factor that may exert an influence on the roles and skills in IS. The larger the organisation, the greater the scope for functional and task specialisation (Pugh et al, 1968). Large organisations are more likely to have big, centralised IS departments and to have broken these up into specialised areas. Smaller organisations, employing fewer staff, may not have a separate IS department or section and are likely to need staff who can carry out a broad range of tasks (NCC, 1989).

The size of an organisation and its physical structure are closely related. In organisations which are small and physically centralised, it may be easier for IS professionals to keep in touch with the business and to interact with users. Where an organisation is large and geographically dispersed, there may be limits on the amount of contact with users and the service provided by the IS department/division. In this situation, the roles of staff may be more technically focused than in organisations where users and IS professionals can interact on a regular basis.

Another attribute of an organisation that may influence the roles of IS professionals is what is usually termed "corporate culture". The latter refers to "the organisation's sets of values, norms and beliefs - reflected in different structures and systems" (Handy, 1986). The IS literature suggests that there may be a link between the culture of an organisation and the roles of IS professionals. Carlyle (1989), for example, maintains that the attitude of an organisation towards technology, reflected in its culture, determines the status of IS professionals. He has identified two types of organisational culture:

> *... The first type of culture arises at companies which regard technology and, by association, technologists, as a capital asset, something that is likely to give them a competitive edge in the marketplace ... The second type of culture forms at companies that don't want to manage their IS professionals ... In this type of company, technology is seen as a cost and IS pro's are a management headache.*
>
> (Carlyle, 1989, p.14)

It could be argued that organisations which have experienced problems in managing IS may have difficulty integrating IS with the business. This "culture gap" may lead them to define IS roles in highly technical or specialist terms.

1.4.1.2 Corporate, IS and Human Resource Strategies

The type of product/service an organisation provides, its size, structure and culture are all likely to influence its corporate strategy and vice versa. Thompson (1995) defines corporate strategy as the process of "deciding what business the organisation should be in and how the overall group of activities should be structured and managed". In order to achieve corporate objectives, management may need to change IS and human resources within the IS function. The corporate plan, and the organisation's strategies for managing IS and human resources are therefore likely to exert an influence on roles in IS.

1.4.1.3 Location, Status, Structure and Management of the IS Function

The location, status, structure and management of the IS function may all have a crucial bearing on roles. The roles of IS professionals in organisations

that have a centralised IS department, for example, may differ from those that do not have an IS department or have decentralised their IT facilities to the business areas. Where an organisation has a large IS department that maintains strong control of the organisation's information resources, the role of staff may be more technically oriented than in organisations that have decentralised their IT facilities and redeployed IS professionals to work in the business areas. Support for this argument can be found in the work of Friedman and Cornford (1989) who suggest that the centralised structure of many data processing departments in the 1960's fostered a strong technical orientation to systems development.

Changes in the structure of the IS function and its status within the organisation are often initiated by, or result in, a change of leadership within the IS function. Hirschheim et al (1988) argue that the trend in many organisations over the last few years has been to place a business manager in charge of IS. This measure is usually in response to complaints about the slowness of the IS department to respond to user needs. These business leaders are likely to introduce changes that will affect roles either directly or indirectly. Changes in the organisation of work, for example, may have a direct impact on the scope of the IS professional's role. Changes in the culture of the IS function may alter IS professionals' perceptions of their role, the IS function and the business community they serve.

1.4.1.4 Type of Systems Used

The last sub-section highlighted changes in the roles of IS professionals resulting from changes in the management of the IS function. These changes may arise, in turn, from changes in the use of technology within the organisation. This is the argument of the Stages of Growth Hypothesis

referred to earlier in the Chapter. Although changes in technology may not affect roles directly, the systems already in use in the organisation may influence the content of the IS professional's role. Any decision management makes with regard to investing in new systems may also have implications for the roles of those who will develop, maintain and use the systems.

1.4.1.5 Approaches to Systems Development

The approach an organisation uses to developing systems may have a significant influence on roles in IS. The roles of IS professionals in organisations that adhere closely to structured methods of systems development, for example, may be different from those that are using more "modern" approaches, such as Rapid Application Development (RAD). Structured methods typically recommend that systems development should proceed in a linear path through the life cycle (the waterfall approach) wheareas RAD reduces the steps involved in the development process. The emphasis on following a sequence of steps in a logical order in structured methods tends to encourage specialisation and division of labour (Friedman and Cornford, 1989). RAD, by contrast, tends to encourage the development of a broader range of skills (Martin, 1991). IS professionals in organisations using Rapid Application techniques, therefore, may carry out a wider range of tasks, and require a wider range of skills, than those which rely on more traditional approaches.

1.4.1.6 Managerial Control Strategies

A key influence on roles may be the strategies managers use to exercise control within organisations. The IS literature identifies two broad strategies that have been used to regulate the work of IS professionals (Friedman and

Cornford, 1989). One has been to break tasks up as much as possible and to reduce the amount of discretion IS professionals can exert over their work. The other is to allow IS professionals to exercise "responsible autonomy" in carrying out their duties. Writers such as Braverman (1974) and Kraft (1977) argue that the predominant strategy in IS, certainly during the 1960's and 70's, was to simplify the work as much as possible and to exercise tight control over labour. Kraft (1977) cites the introduction of structured programming, canned programs and the use of chief programmer teams as evidence of a concerted effort on management's part to deskill programmers and bring "computing" under management control.

Although Braverman and Kraft's theses offer a plausible explanation of some of the changes in the skills profile of programmers during the 1960's and 70's, Friedman and Cornford (1989) suggest that they tend to overstate the social determinants of change. While the introduction of structured methods may have been a factor reducing the level of skill amongst programmers in the 1970's, the evidence suggests that further specialisation and routinization of tasks did not occur in the 1980's. Thus, while managerial strategies of control may have an important influence on roles, the strategy that is adopted is likely to vary according to the situation and change over time.

1.4.1.7 The Influence of the Occupational Community

The term "occupational community" is used by Van Maneen and Barley (1984) to refer to:

> *... a group of people who consider themselves to be engaged in the same sort of work; whose identity is drawn from their work; who share with one another a set of values, norms and perspectives that apply to but*

extend beyond work related matters; and whose social relationships meld work with pleasure.

(Van Maneen and Barley, 1984, p. 287)

Many writers believe that the occupational community in IS exercises a powerful influence on the way IS professionals behave. Galliers, for example, suggests that one of the reasons integrating IT with corporate objectives has been difficult to achieve is the entrenched attitudes of the IS community (Galliers, 1990).

1.4.1.8 The Influence of the User Community

Another "group" that may influence the roles of IS professionals is users. The Stages of Growth Hypothesis suggests that as computers have become more pervasive in organisations users have taken increasing responsibility for IT in their area (Rockhart, 1988; Galliers and Sutherland, 1991). This is confirmed in a number of articles, reports and papers (Gilmore, 1988; Hirschheim et al, 1988; Jones, 1993). Indeed, City University's report on changing skill requirements points to some redistribution of roles between IS staff and users, with users assuming responsibility for many of the routine tasks that used to be carried out by IS professionals (City University, 1991). The appointment of users to senior roles in IS has been a further factor eroding the position and traditional power base of IS professionals (Hirschheim et al, 1988).

1.4.1.9 The Occupational Structure

The organisation's occupational structure and career system may exert a significant influence on the way roles develop. The former will define the boundaries between different roles and the relationship between different

positions; the latter will influence the opportunities for development. The scope for change in roles may be quite limited, for example, in organisations where there is a high degree of functional specialisation, the hierarchy is rigid and there are few opportunities for mobility, training and career development. All the studies of changing roles and skills in IS conducted over the last few years stress the need for employers to change the occupational structure and to restructure the career system to create opportunities for development (Keen, 1988; BCS, 1990; City University, 1991). The problems of functional specialisation, and the need for greater intra-organisational mobility have, in fact, been recognised for some time as articles published in the computing press in the late 1960's and early 1970's clearly indicate (Yearsley, 1969; Lendon, 1970; Smythe, 1971).

1.4.1.10 The Internal Labour Market

The internal labour market is the phrase used to describe the flow of people through jobs within the organisation (Hendry, 1995). In IS, the evidence suggests that there has been an inflow of people from different functional areas into IS but little movement out of it (Friedman and Cornford, 1989). Although the effect of recruiting users into the IS function would, presumably, be to increase business awareness amongst IS professionals, the low levels of mobility out of IS may foster role specialisation.

1.4.1.11 Individual Factors

In Section 1.2 it was suggested that roles are not simply a reflection of the social structure or the outcome of other people's expectations but are a product of the individual's own interests, abilities and actions. This is why a key aim of the present research was to elicit the systems analyst's perception

of the impact of change on their role. This section focuses, therefore on the way IS professionals define and shape their role.

The evidence suggests that IS professionals have tended in the past to emphasise the technical aspects of their work. Mumford's research on sources of job satisfaction amongst analysts and programmers, for example, found that although users of the companies investigated wanted analysts who were "experts in the business procedures of their own company" the analysts themselves tended to define their role in technical terms (Mumford, 1972).

Research on the personality and motivational profiles of IS professionals provides additional support for this finding. The results suggest that they exhibit many of the traits usually associated with "specialists", that is, they are more interested in things than people, prefer working alone, etc. The best known study of the personality profiles of IS professionals was carried out by Lyons (Lyons, 1985). Lyons survey covered 1,200 IS professionals in over 100 companies in different countries and showed that respondents scored highly on measures for introversion, thinking and judging, characteristics that tend to be found in people who prefer to work alone. Research by Cougar and Zawacki (1980) and Zawacki, (1992) on the motivational profiles of IS professionals indicate that they have a low need for affiliation, suggesting, once again, that they prefer working alone and are not strongly people oriented. While these results appear to be fairly consistent, they should be interpreted with caution. Two of the studies are quite dated now. It is possible that changes in the educational system, together the type of people being recruited into IS would alter the personality/motivational profile for IS. Secondly, the findings may reflect the influence of the work environment rather than the traits of individuals (Ferratt and Short, 1988).

The last point draws attention to the social factors that may influence the way IS professionals define and shape their role. Social learning theory would suggest that differences between individuals in terms of their family background, family commitments, cultural background, education and previous work role experiences would influence their perception of their role and how they may seek to change it [6]. Someone who is well qualified, for example, is likely to view their role differently from someone who has learnt on the job.

The experience an individual has of his/her role and the amount of "organisational knowledge" they have acquired may also influence their role behaviour. An individual who is comparatively new to a role has to learn something about it before they can begin to change it to reflect aspects of their own personality. An individual who has accumulated a great deal of knowledge about the organisation is likely to play their role differently from someone who is a newcomer and lacks an understanding of the context in which the role is played.

In addition to these "social" differences, it is important to add the biologically based differences of sex and age. The different socialisation experiences of males and females and societal attitudes towards age may influence how IS professionals would both define and play their role. With regard to gender, for example, a recent survey carried out by Virgo on behalf of the Institute for Data Processing Management found that women account for only six per cent of those occupying head of IT posts (Virgo, 1996) [7]. If women find it difficult to get ahead in their career this may influence the way they view their role and the organisation.

The preceding analysis suggests that individuals actively define and shape their role and is consistent with symbolic interactionist and interpretive theories of human behaviour. Functionalists, however, argue that individuals are heavily constrained by the expectations of others (Parsons, 1957). It is important to determine, therefore, whether there are circumstances under which IS professionals can exert control over what they do. Research by Heimer (1984) which examined the career histories of thirty-three employees of engineering consulting companies working on several different oil projects in the North Sea, suggests that control over career development is heavily influenced by organisational factors. However, those groups who are deemed central to the mission of organisation are typically able to exert more influence over their career development than those who are less central.

1.4.2 The Outer Context

In Section 1.1 it was suggested that the organisation and the individual are influenced by events in the "outer context". This section identifies factors in the outer context that may, indirectly, shape roles.

1.4.2.1 Political, Social and Economic Factors

Events in the political, social and economic environment may influence roles indirectly through their impact on the business environment and the structure and functioning of organisations (Mendenhall et al, 1995). In the international arena, events such as the formation of the European Union, the dissolution of the Soviet block, the growing importance of Japan and rapidly expanding economies of many hitherto Third World countries have altered the relative distribution of power in the world and provided the stimulus to change in the UK's political and economic system (Clarke, 1992; Jamieson, 1994). In

addition to these changes, there have been important changes in the social environment that have influenced organisational behaviour over the last few years. Demographic trends, notably, the fall in the birthrate and the ageing of the population have affected demand for products and staffing within organisations (Keynote, 1994). Managers in organisations have had to take account of these developments and changes in the law that enshrine changes in social attitudes.

1.4.2.2 The Business Environment

The most significant developments in the business environment in recent times have been the globalisation of business and the growth of international and domestic competition (Lorange and Roos; 1992, Kanter, 1995). The effects of this on UK companies is reflected in the trend towards downsizing, outsourcing, colloborative partnerships between companies, etc. These changes have increased the overall importance of IT and made IT critical to the survival of many organisations (Davidow and Malone, 1992; Ching et al, 1996). The growing importance of IT in enabling change and increasing competitiveness is reflected in City University's findings and is identified as a key factor driving change in the role and skill profile of IS professionals (City University, 1991). The BCS's report on hybrids also stresses the role of business change, arguing that it has greatly increased the need for IS professionals who can use technology to improve the organisation's competitive position (BCS, 1990).

1.4.2.3 Technological Factors

The roles of IS professionals may be influenced by the types of system that are currently available in the "external" market. As new systems become

"industry standard", there may be considerable indirect pressure to invest in them. In the last few years, for example, there has been a move away from mainframe computing towards micro's (NCC, 1994). As demand declines for certain types of hardware and software, and increases for others, the pattern of demand for skills also changes. The IS literature contains many articles, papers and reports advising readers on changes in demand for skills resulting from the introduction of new technologies (Manchester, 1988, BCS, 1990, City University, 1991). The type of systems available, therefore, may influence roles through their impact on the level of demand for certain skills.

1.4.2.4 Approaches to Systems Development

The approaches used to develop systems may be a factor influencing the way roles develop. As suggested earlier, the roles of IS professionals in organisations using approaches to systems development that compress the phases of the life cycle may differ from those that adhere to the classic waterfall method. Approaches that require more active involvement of users may also influence the content and scope of roles. Although structured methods do call for user involvement, this is emphasised more strongly in "newer" approaches such as Prototyping (Floyd, 1984), Rapid Application Development (Martin, 1991) and Soft Systems (Checkland, 1981; Checkland and Scholes, 1990).

1.4.2.5 The Education System

The calibre of people who enter computing is influenced by the quality of education provided in schools and colleges. In the schools, computing is now an essential part of the National Curriculum and resources for educational computing are an electoral issue (Cole, 1996). In the Higher Education sector,

IT is part of management education courses and a number of colleges and universities have introduced undergraduate and postgraduate qualifications in business information technology [8]. The importance accorded to computing in schools and to the business applications of computing in colleges may mean that those people entering computing now and in the years ahead will have a different orientation to their role than previous generations.

1.4.2.6 Labour Market Factors

It is from the external labour market that organisations draw their new recruits. The calibre of people in the external labour market is influenced partly by the quality of provision in the education system and partly by the availability of skills. If there is a plentiful supply of high calibre recruits, the roles of IS professionals may be subject to a greater degree of change than if there are shortages of people with skills in particular areas. The evidence suggests that both the calibre of recruits and skills shortages have been a problem in IS (Pearson et al, 1988; NCC, 1989; Friedman and Cornford, 1989). Even in the early years of computing there was concern that those entering the profession were too technically oriented to develop effective business systems (Pettigrew, 1973) This, and persistent skills shortages, prompted many organisations to recruit internally into IS (Friedman and Cornford 1989). The effect of recruiting users into data processing departments may be to increase business awareness in IS and alter existing staff's attitudes towards their role.

1.4.2.7 Outsourcing

One of the factors that is changing the traditional concept of the organisation and may be influencing roles is the trend towards outsourcing. Instead of providing all services in-house, organisations are increasingly hiving off responsibility for non-essential services to facilities managers or devolving responsibility for some business processes to a third party (Richardson, 1993). The IS department in many organisations is a prime candidate for outsourcing. Although there is concern about the drawbacks of outsourcing, the evidence suggests that more and more companies are turning to outsourcers to reduce their IT costs and improve efficiency (Earl, 1993a; Price Waterhouse 1993/94; The Economist, 1995). What impact outsourcing has on roles in IS, however, is difficult to gauge. Since the primary reason to outsource is to cut costs or obtain specialist skills not available in the organisation, it seems likely that those whose skills are transferred to the outsourcer will either be engaged in routine tasks that can be carried out more cheaply by the outsourcer or tasks requiring specialist skills and those who remain in-house will be responsible for a broader range of activities. The precise impact of outsourcing on role, however, is likely to depend on the arrangement the organisation has with the outsourcer.

1.4.2.8 Sectoral Influences

Events in the political, economic, social and technical environment may stimulate changes at the sectoral level that affect organisations within a particular sector in a similar way. The growth of domestic and international competition and the introduction of deregulation in the financial services sector, for example, had a profound impact on the operation of financial companies in the 1980's (Plender and Wallace, 1986). Research by Spender,

discussed in more detail in Chapter Four, suggests that financial companies would tend to respond in the same way to these developments, that is, they would follow "strategic recipes" (Spender, 1989). Changes in strategy in response to sectoral changes may push organisations in the direction of introducing similar changes in the organisation and hence in the roles of staff. It could be argued, therefore, that sectoral changes may have a significant influence on roles through their impact on corporate strategy.

1.4.2.9 Occupational Influences

Another factor which may influence roles is events that occur at the occupational level. Over the last ten or fifteen years there have been a number of changes at the occupational level which may have influenced how the organisation views IS professionals and how IS professionals view themselves. One of the key trends has been the drive to develop IS professionals with a greater degree of business competence (BCS, 1990). The importance attached to business competences is reflected in the BCS's Industry Structure Model and has been vigorously endorsed in the pages of the computer and business press (May, 1987; Levi, 1990; Meiklejohn, 1990). The perception that business competences are important may influence how IS professionals and managers define roles in IS.

1.4.2.10 The Professional Bodies and Trade Unions

The bodies which exist to regulate the profession and represent the interests of computing professionals may exert an influence on the roles of IS professionals. The BCS is perhaps the most important professional body. Its Industry Structure Model lays down the main occupational categories and indicates what qualities, skills and experience are required to be accredited at

particular levels. While it is possible to practise without becoming a member, the occupational boundaries defined by the professional bodies still provide a context for development which influences the way both individuals and organisations perceive roles and career development.

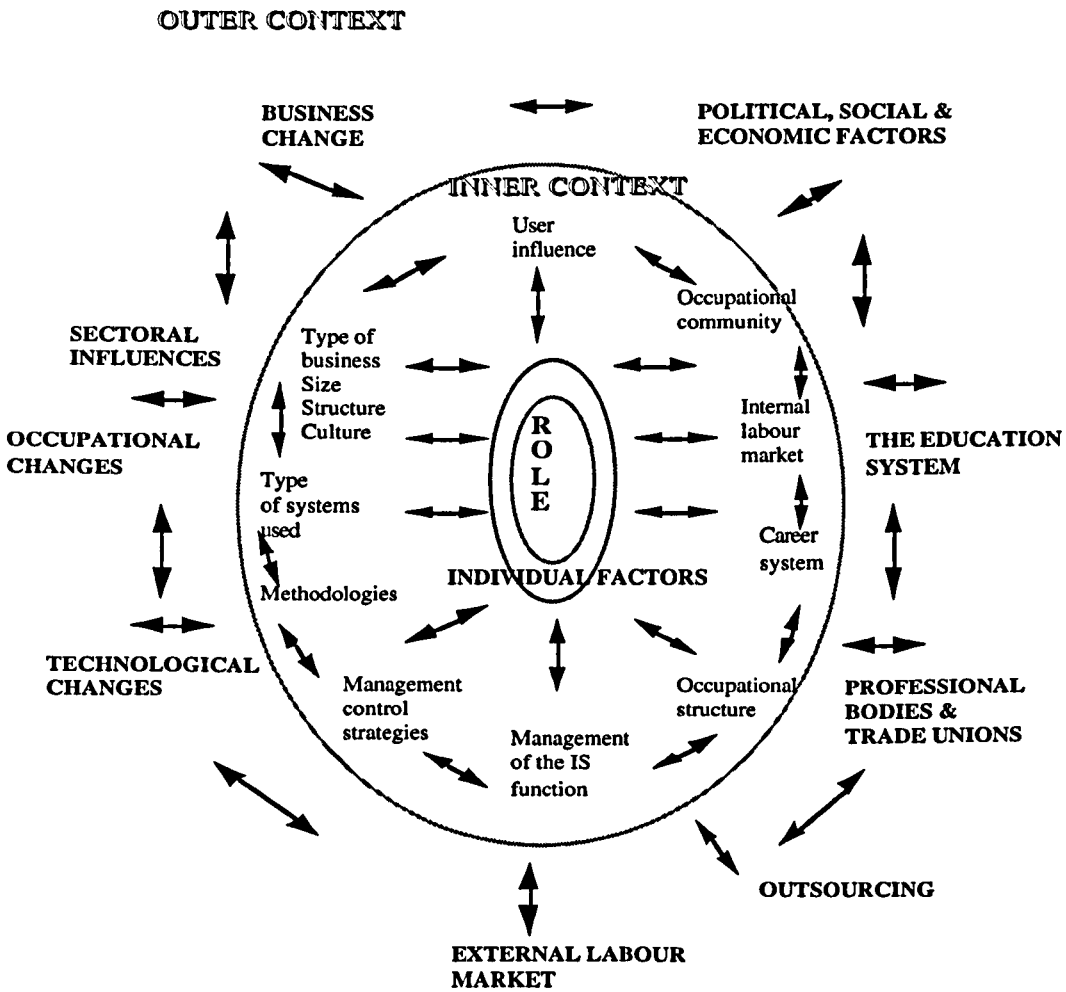
Trade unions are another "external" group that may influence roles. IS professionals have traditionally enjoyed a such strong market position, it could be argued that the economic incentives to join a union have not been as great as they have for poorer paid workers. There is some evidence, however, that membership is growing amongst computer staff. The Banking Finance and Insurance Union (BIFU) confirms that membership amongst IS professionals has risen in recent years and the Union now has a special section for them [9]. The fact that trade union membership appears to be rising may point to changes in IS professionals' perception of their position and status.

1.4.3 A Model of the Factors Influencing IS Roles

Figure 1 models the factors in the inner and outer context that influence roles and the interrelationships between them.

Figure 1

A MODEL OF THE FACTORS IN THE INNER AND OUTER CONTEXT THAT INFLUENCE THE ROLES OF IS PROFESSIONALS



Role is depicted in the centre of the "inner context" in the model. The boundaries around role, the individual and the inner context are drawn as a dotted line to emphasise their permeability. Double-ended arrows are drawn linking different factors in the model to indicate that a reciprocal influence process exists between them.

The double-ended arrows that link role to the individual and role and the individual to the inner context indicate that roles are influenced by both the

organisational context and the actions of individuals. It follows that any change in the organisation will influence the behaviour of individuals and the roles they play and any change in the individual will influence role behaviour and the organisation.

Double-ended arrows are drawn linking different factors in the outer context and in the inner context to one another. Thus, changes in the political, economic, social and technical environment, for example, will stimulate change in the education system which will in turn stimulate change in the external labour market and so on.

Changes in the outer context will also exert pressure for change on the inner context. Thus, changes in the political, economic, social and technical environonment may result in sectoral changes which will in turn influence the strategies pursued by organisations in that sector. Any change in strategy will affect the structure and culture of the organisation, the division of labour, the roles of staff, the career system, etc. Changes in any of these internal factors will also be a stimulus to change in the others.

Changes in the inner context will, of course, create pressure for change in the outer context. Thus, changes in the roles of IS professionals may act as a stimulus to change at the occupational or sectoral level. The dynamic interplay of forces in the inner and outer context suggest that roles are in a state of continuous change.

1.5 Dynamics of the Change Process

While the model certainly gives the impression that there are continuous pressures for change: in reality, there are also considerable constraints on

change. Brooke's research for City University and the BCS's report on hybrid managers, quoted earlier, indicate that there are many external and internal factors that slow the pace of change (BCS, 1990; Brooke, 1991). In the outer context, for example, a shortage of skills may affect the supply and calibre of people being recruiting into organisations and IS. In the inner context, the structure and culture of organisations, the activities of groups, etc., may all act as constraints on change.

Most managers would regard these constraints as a potential threat to the organisation and something to be overcome. This view is strongly endorsed in both the management and IS literature. Kanter, for example, urges managers to become "masters" not "victims" of change (Kanter, 1983). Functionalists take a different view. According to functionalists, constraints on change arise to protect the organisation from the adverse effects of change. They are thus part of its "natural" defence system (Parsons, 1957; Timasheff and Theodorson, 1976). Since organisational change depends on bringing about change in roles, functionalists would argue that the dominant groups in the organisation, i.e, managers have a vested interest in defining roles as tightly as possible and limiting the scope for change. In this way, organisational inertia becomes a constraint on change in roles and lack of change in roles become a constraint on organisational change.

This argument suggests that the constraints on change in roles may be insuperable. If this were the case, then clearly, organisations would either stagnate or change so slowly that the effects would be imperceptible. The fact that organisations do change, sometimes, quite dramatically, raises the question of how change in organisations and change in roles comes about. Since the aim of the research was to examine the impact of change on roles, it was important to try to answer this question.

One way of conceptualising the change process is to examine the interplay of forces for and against change. This is the basis of Lewin's fields of force model of change (Lewin, 1952). Lewin argues that organisations seek to maintain stability but that they are always in a state of "quasi stationary equilibrium", i.e. prepared for change. Over time, pressures will build up that threaten this stability. The pressures for change will often be the same as the pressure against change. If the forces for change eventually become greater than the forces against it, the organisation's natural balance is disturbed and change occurs.

Lewin's analysis is intuitively appealing but has been criticised on a number of grounds. The idea that organisations seek to maintain stability, for example, implies a natural unwillingness to change. It could be argued, however, that the desire for change is "more natural" since it is only by embracing change that organisations can survive and grow. This is a valid point but there is nothing in Lewin's analysis which suggests otherwise. The fact organisations are described as being in a state of "quasi-stationary equilibrium" implies a readiness for change.

The theory may also be criticised for failing to describe contemporary conditions (Dawson, 1994). Lewin developed the fields of force model in the early 1950's, before computers had come into commercial use and greatly accelerated the pace of change. At the time he was writing, therefore, organisations were less vulnerable to pressures for change, particularly in the technological field. Although there is some substance in this criticism, it does not invalidate the fields of force concept. If organisational change occurs more rapidly now all this means is that the pressures for change build up more quickly and have more dramatic effects.

In spite of the problems with Lewin's model, it offers a useful vehicle for interpreting the process of change in roles. The next section looks at how the model can be used to examine the impact of change on IS roles.

1.6 Applying Lewin's Model to Roles in IS

In terms of the present discussion, Lewin's analysis would suggest that there are forces in the outer and inner context that drive and constrain change in organisations and roles. When the forces pushing organisations in the direction of change are greater than those pulling in the opposite direction, organisational change and change in roles is likely to occur. Section 1.6.1 examines the forces in the outer context that may be driving and constraining change in roles. Section 1.6.2 examines the forces in the inner context that may be driving and constraining change in roles.

1.6.1 Forces for Change and Against Change in the Outer Context

As suggested in Section 1.4.2.1 general changes in the political, economic, social and technical environment are a major force for change in organisations. In terms of the present research, the main effect of these changes over the last fifteen or twenty years has been to stimulate domestic and international competition. Of particular importance is the trend towards globalisation (Kanter, 1995). As organisations have expanded beyond their national borders, IT has been used to support communications across a wider geographical area (Earl, 1993b). This has, in turn, stimulated demand for IS professionals with a broader range of skills, particularly in networking. Data from skills surveys confirm that demand for IS professionals with network skills has grown faster than almost every other category over the last few years (NCC, 1989; NCC, 1994; NCC, 1995).

The trend towards conglomeration, another consequence of increased competition, may also exert an influence on roles in IS [10]. The structure and functioning of organisations that are taken over by a conglomerate may change significantly as control passes to the conglomerate. In IS, the systems and software used and the type of service provided may all change in the aftermath of a successful bid. Fiderio (1989) argues that this, and changes in personnel policy, may result in significant restructuring in IS. Thus, projects may be abandoned; staff may be made redundant; salary scales may be revised; new benefit packages may be introduced, etc. All these developments are likely to be a significant force for change in roles.

A further trend that may influence IS roles is the emergence of colloborative relationships between organisations. The latter may be a major force for change in roles for a number of reasons. Firstly, because constituent firms are expected to share knowledge and expertise, the roles of IS professionals may benefit from exposure to a wider range of influences. Secondly, the colloborative arrangements may be temporary in which case roles are likely to change more frequently and require a higher degree of flexibility.

Outsourcing was identified earlier as potential force for change in roles. The growth of outsourcing in the 1990's is another aspect of the trend towards colloboration in securing competitive advantage. In America, where the trend towards outsourcing has gone much further, large corporations routinely outsource significant parts of their IT function. Electronic Data Systems (EDS), for example, has a $3.2 billion contract to run Rank Xerox's computer and telecommunications networks. This deal involved transferring 1,700 of Xerox's staff to EDS (The Economist, 1995).

Changes in the use of technologies and methods to develop systems may be driving change in organisations and roles. Research by Earl (1993c) suggests that the IS function is having to cope with new technologies being "continously" invented and increased demand for systems that offer portability, flexibility and interoperability. These developments require staff with greater flexibility and understanding of users' needs. This is, in turn, increasing pressure for approaches to systems development that involve users more closely in the development process.

Changes in the skill profile of IS professionals is heavily dependent on changes in the provision of education and training. As suggested in 1.4.2.5 IT is now part of the curriculum and colleges and universities have begun introducing business related IT courses. While it is difficult to assess the benefits of this or its impact on organisations, the fact that those entering the labour market are likely to be more conversant with technology and business may be a significant force for change, particularly in organisations that have traditionally recruited people into IS from a scientific background.

The professional bodies have been active in supporting the drive to develop hybrids. The BCS, in particular, has drawn attention to the need for better education in the business applications of IT and incorporated business competences in the job description of many occupational categories in its Industry Structure Model. The BCS has also stressed the need for greater flexibility in defining jobs in IT. The recently revised Industry Structure Model uses role profiles rather than job descriptions to describe the activities of IS professionals within a particular occupational category (Kavanagh, 1996a). Since the Industry Structure Model is used in over 500 organisations, some of them large concerns, it could be argued that the BCS's activities over the last few years have been an important force for change in roles.

As well as pressures for change, there are also pressures to maintain stability or prevent change. The growth of domestic and international competition, for example, poses a threat to many organisations. A recent study by Standard and Poor's, the credit rating agency, shows that competition is the main risk facing financial institutions (Tehan, 1996). Another survey by the Centre for the Study of Financial Innovation supports this, claiming that intense competition will be the cause of the next banking crisis (Tehan, 1996).

Although intense competition may be feared, the evidence suggests that organisations find colloboration with other organisations, particularly former rivals, difficult. Kanter, a keen proponent of colloboration, admits that it is difficult to persuade companies to "partner" effectively (Kanter, 1995). If organisations have difficulty responding to pressures for colloboration, roles may be subject to less change than supposed. Similarly with outsourcing, the difficulties with maintaining good relationships with suppliers, of guaranteeing effective customer service, etc. are persuading some companies to "reinvest" in their own organisation (The Economist, 1995).

Technology is another potential constraint on change. While the costs of IT have fallen, it could be argued that many organisations are finding it difficult to keep pace with the rate of technological innovation thus slowing down the overall rate of change. There is some evidence to support this in the educational sector. Earlier it was suggested that changes in education, particularly the inclusion of IT in the curriculum may be a force for change in organisations. However, reports suggest that while large sums have been invested in educational computing, many schools cannot afford to keep up with changes in technology (O'Leary, 1996).

The last point draws attention to the potential impact of skills shortages. Although the data suggests that companies experienced less difficulty recruiting IS professionals in the early 1990's than they did a decade previously, skills shortages are once again emerging as a key constraint on change. In 1995/96 many companies reported serious shortages of analyst/programmers and IS professionals with skills in C++ and Cobol. A survey by Delphi, which covered 270 organisations, estimates that skills shortages are are adding 21% to UK company costs (Kavanagh, 1996b). Skills shortages are expected to slow the pace of development and increase reliance on contract staff. If organisations employ more contract staff this also is likely to be a factor driving change in roles.

1.6.2 Forces For Change and Against Change in the Inner Context

1.6.2.1 Drivers of Change

In section 1.4.1.1 it was suggested that the goals of an organisation - what it exists to do, e.g. provide certain products/services - influence the role and skill profile of IS professionals. In some organisations, technology is crucial to the achievement of the organisation's goals in others, it is not. If, as a result of changes in the competitive environment, an organisation that is not reliant on IT moves into an area that requires investment in IT, or if an organisation that already relies on IT changes its goals, this change will have implications for the roles and skills of IS professionals. Since these changes are typically reflected in the organisation's strategy for managing the business, changes in corporate strategy may be a key factor driving change in roles.

There is a vast literature on the nature and process of corporate planning which identifies the different strategies organisations may pursue to achieve

their objectives, purposes or goals. Here, it is only necessary to point out that if an organisation changes its strategy significantly, e.g. if it moves from a strategy based on low cost to differentiation, this is likely to have important implications for its IS strategy. An organisation which attempts such a radical change will almost certainly have to invest heavily in new systems in order to make the transition.

Changes in corporate strategy and strategies for managing IS have implications for an organisation's human resource policies. The latter will identify the personnel systems which need to be put in place to facilitate change. New approaches to human resource management might therefore be a force for change in roles. If the organisation is attempting to alter its corporate strategy, and new systems are to be introduced to achieve this, the organisation may need to recruit new people into IS, provide training in the use of new systems, create new reward systems, etc. Without these changes, the organisation may lack the basic competences to implement the proposed changes.

Changes in the approaches used to develop systems may also be a force for change in certain circumstances. Research by Friedman and Cornford (1989) on behalf of the National Computing Centre points to growing use of "modern" approaches to systems development, such as Prototyping. As these require closer contact with users and the business areas, pressure may be exerted on IS professionals to acquire a broader range of competences.

The supply of labour was identified earlier as a factor influencing IS roles. This may be a force for change where, for example, management alters its policies for recruiting and developing staff. To compensate for shortages of technically qualified staff, it may be necessary to take on people from a non-

technical background (either from within the organisation or outside it) or to recruit hybrid graduates. Changes in the types of personnel recruited into IS may bring about change by altering the ethos of IS; the perceptions of technical professionals and user attitudes.

Changes in the structure of the organisation may be another force for change in IS roles. If management introduce a policy of "corporate downsizing", for example, the effect may be to create a flatter organisational structure and encourage multi-skilling (Handy, 1990). These changes may influence the relationship between the IS department/division and user areas and also the roles of IS professionals (O'Leary, 1992). Changes in the structure of the IS department/division itself may also have an impact on roles. The trend towards decentralising IT resources and the growing use of facilities managers may influence the organisation of work, the ethos of the IS department/ division, the content and scope of roles and the attitudes of IS professionals.

A further force for change may be changes in an organisation's culture. Where an organisation downsizes, and a flatter structure emerges the effect, over time, may be to reduce the degree of functional specialisation. This may in turn foster a culture which is less bureaucratic (Handy, 1986). In the IS department/division, changes in structure - splitting up the department, turning it into a profit centre, hiving off parts of it to facilities managers, etc. may also affect its culture. Over time, there may be less emphasis on the technical aspects of systems development and more emphasis on using technology to meet the needs of the business.

Changes in the occupational structure, particularly the emergence of new specialisms, may be a powerful force for change. A study by Pettigrew of the

emergence of occupational specialisms, suggests that as one group declines in importance, new occupational specialisms emerge to take their place (Pettigrew, 1973). This may alter the scope, content and relative importance of some roles. The "emergence" of a plethora of more business-oriented roles in IS over the last few years, for example, may be instrumental in redefining traditional roles and creating new occupational categories.

Strategies of management control were mentioned earlier as a source of influence on roles. Two types of strategy were described: one was based on the concept of responsible autonomy, the other on control of labour. Although Braverman (1974) and Kraft (1977) would argue that forces inherent in the capitalist mode of production will inevitably drive managers in the direction of the latter strategy, it could be argued that the increasing complexity of organisational life, and the need for more highly skilled and flexible employees may act as a spur to management to introduce policies that increase the degree of discretion IS professionals have over their role. Where this is the case, management strategy could be a force for change.

Another force for change in roles may be the occupational community. The latter may be a force for change where members combine to advance their interests. This may happen, for example, in response to the growth of user power. To satisfy user demands, and to retain some control over IT, the community may feel it necessary to modify traditional attitudes. City University's report, which calls on IS professionals to change entrenched attitudes and "share responsibility" for the effective use of IT indicates that pressure is growing on the IS community to change its outlook (City University, 1991).

A final driver of change arises from the actions of individuals themselves. IS professionals may take the initiative and either redefine their role or acquire a wider range of skills. They may do this for many reasons, e.g. to add interest to their job, to improve their prospects of career advancement. Since career advancement usually depends on the demonstration of skills valued by the organisation, IS professionals may have a strong incentive to change their role in ways that are consistent with the objectives of organisational change.

1.6.2.2 Constraints on Change

The organisation's corporate strategy was identified earlier as a force for change. It may have the opposite effect where management decide, for example, as part of its overall strategy, to reduce expenditure on new technology or prolong the life of old systems. In both cases the skill requirements of IS professionals may remain unchanged. Where this happens, there is a danger that staff are unable to update themselves on newer technologies. While there are a variety of ways management can overcome this problem, e.g. offering flexible retraining, there may be strong economic incentives to retain IS professionals with skills in particular technologies.

An organisation's policies for managing its human resources may also act as a constraint on change. Failure to provide adequate training, for example, would make it extremely difficult for IS professionals to acquire the competences necessary to develop their role or to perform effectively. There is certainly evidence of a lack of planning in human resource terms for the introduction of new technology. Senker et al observe that:

> *British managers have often neglected to consider the implications of automation for work organisation, and in particular they have frequently paid insufficient attention to the need for training programs necessary to secure maximum economic advantage available from the use of new technology.*
>
> *(Senker et al, 1992, p.59)*

Clearly, if management have little idea of the skill requirements likely to arise from new forms of technology, and are unable or unwilling to invest in the training necessary to make effective use of it, the scope for change in roles will be constrained.

The approaches used to develop systems may also act as a constraint on change. Structured approaches to systems development encourage specialisation and the division of labour (Friedman and Cornford, 1989). While many companies are employing new approaches to developing systems, the more closely an organisation adheres to structured methods, the less scope there there may be for flexibility and change.

The availability of labour may act as a constraint on change. The problems created by skills shortages have been discussed previously. A rather different problem is what City University's report refers to as the "skills wastage" (City University, 1991). The report suggests that companies may not be making the best use of their resources because they have erroneous ideas about the skills necessary to carry out certain jobs. If IS professionals are given jobs for which they are unsuited or which fail to harness their abilities, or if they are overlooked for certain jobs because it is believed that they lack the necessary abilities, the scope for organisational change and change in roles may be limited.

An organisation's structure may limit the scope for change in roles. In organisations that have fostered a high degree of functional specialisation or where the IS department/division is geographically isolated from the rest of the organisation, IS professionals may become "cut off" from the rest of the organisation and may be unable to accept, or adapt to, change. There may be structural impediments to change within the IS department/division itself. Where there is a clear division of labour and tasks are highly fragmented, for example, it may be difficult for IS professionals to develop a wide range of competences.

The culture of the organisation and of the IS department/division may also act as a constraint on change. If the general culture of the organisation is traditional and conservative, it may be difficult to introduce radical change into the IS department. If the IS department has been established a long time and has evolved a culture that values and rewards technical competence, it may be difficult to implement changes that would encourage a different set of values.

Another factor which might affect the scope for change is the occupational structure, as reflected in existing divisions of labour, e.g. between management and technical staff. Braverman (1974) and Kraft (1977) would argue that any change which threatened to erode management's position or the position of powerful groups within the organisation would be strongly resisted. An organisation which attempts to develop multi-skilled IS professionals, for example, might encounter resistance from managers or groups in specialist areas who feel that their own role is likely to be descoped.

The emergence of new specialisms, identified as a force for change earlier, may be a force against change where it produces a backlash amongst

members of occupational groups adversely affected by change. Thus, to preserve their status and position, groups that feel threatened by other groups, inside or outside the occupational community, may respond by failing to co-operate with the change process. Where the occupational community as a whole feels threatened by change, e,g. by the introduction technologies that may deskill members or reduce their control within the organisation, pressure may be exerted to slow down or prevent change occurring.

A further constraint on change may be the attitudes, abilities and actions of users. Users may slow the pace of change where they have little experience of computers or where they are apathetic and do not wish to accept responsibility for carrying out technical tasks themselves (O'Leary, 1992). It is possible that the redistribution of roles between IS professionals and users, noted in City University's report on changing role and skill requirements, may be viewed as an unnecessary and unwanted burden rather than a source of user empowerment (City University, 1991).

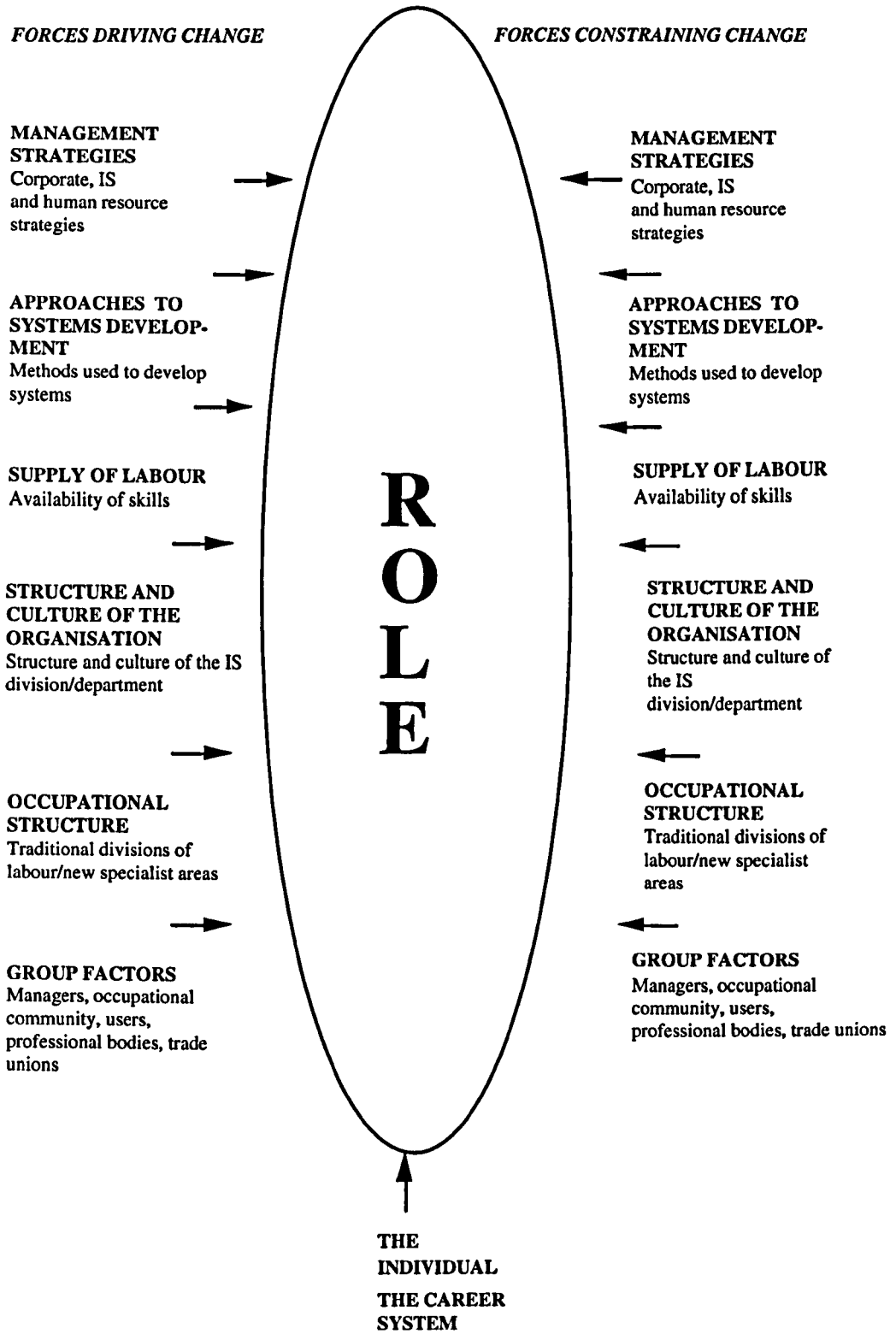
A final factor which must be mentioned is the IS professional's own interests, abilities and aptitudes. If individuals partly determine the boundary of their role, they can decide either to push for, or resist, change in their role. Some individuals may simply decide not to change their role in a way that suits the interests of the organisation. Where this is the case, it may be very difficult to bring about change in the role.

1.6.2.3 Model of the Forces For and Against Change in the Inner Context

These forces for and against change in the inner context are depicted in the Model shown in Fig 2. The forces for change are displayed on the left hand

Figure 2

A MODEL OF THE FORCES IN THE INNER CONTEXT DRIVING AND CONSTRAINING CHANGE IN THE IS PROFESSIONAL'S ROLE



side of the diagram and the forces against change are displayed on the right. The organisation's career system, i.e. its policies for recruiting, training, assigning, appraising, promoting and retiring staff, is positioned between the forces driving and constraining change [11]. The career system is included because it provides the framework within which roles develop and is the formal mechanism for effecting change in the roles of staff. It is important, in view of this, to briefly examine the contribution of each component of the career system to the process of change.

1.6.2.4 The Career System as a Mechanism for Change

The first element of the career system, recruitment, influences the balance of skills within IS. If the policies for recruiting IS professionals remain the same and the organisation continues to select people who have skills/attributes that may no longer required, the scope for change is clearly limited. The higher the level of appointment, the more crucial recruitment becomes because those appointed to senior levels will help to determine the organisation's future.

Training, the second element of the career system, is important because it provides IS professionals with the skills they need to cope with change. If the organisation does not invest in training, or provides the wrong kind of training, IS professionals will lack the competences necessary to perform effectively.

The assignment of staff to work roles, the third element of the career system, determines the types of competences IS professionals require and the contribution they make to the organisation. If IS professionals are assigned to work on particular systems and gain little exposure to the general operation

of the IS department/division or have few opportunities to work in the business areas, they may develop a narrow view of their role.

The procedures for appraising staff, the fourth element of the career system, establish the criteria for evaluating performance and influence promotion decisions. As such they send a powerful message to staff about the knowledge and skills which the organisation values. If none of the criteria for appraisal change, IS professionals may carry on performing in the way they have done in the past and the scope for change may be quite limited

The calibre of staff who run the IS department/division is determined by the procedures and criteria used to promote staff. Promotion systems, the fifth element of the career system, may therefore exert an important influence on roles. If the "wrong" people are promoted to positions of influence, and introduce changes that are inappropriate, this can have serious consequences for the IS department/division, the organisation and the management of change.

The final component of the career system is the organisation's procedures for retiring people. The decisions taken about redundancies and retirement will influence the skill mix within IS and perceptions about the knowledge and skills the organisation values. If the organisation retires people who have skills that are becoming outdated, for example, this may act as a spur to develop skills in areas where there is less threat of technological obsolescence.

1.6.2.5 The Individual as a Change Agent

The individual is also positioned between the forces driving and constraining change in the Model and is identified as an agent of change. Whatever

policies managers introduce, however much they may seek to control individual behaviour, in the final analysis, it is the individual who brings about change in their role. While all individuals influence the roles they occupy in some way, some may be positively motivated towards change; others may view any change in the organisation with deep suspicion and become a constraint on change. These different reactions will help to determine the success of any changes that are introduced within the organisation.

1.7 A Contingency/Contextualist View of Change

The previous section identified forces driving and constraining change in organisations and suggested the way in which the career system and individuals can influence the nature and degree of change in roles. It is important to bear in mind, however, that the forces for and against change, and their effects, are likely to vary between organisations and affect roles differently. Contingency Theory and Contextualism, described in section 1.1, suggest that that this is because no two organisations are exactly alike. Differences between organisations in terms of their products/services, structure, culture, the staff employed, etc. mean that organisations tend to respond differently to pressures for change in the internal and external environment.

It follows that the effects of change are likely to differ in the organisations that took part in the research presented in this thesis. The scope and content of roles of IS professionals affected by change, the skills required to carry out a particular role, and the relationship of one role to another may vary between organisations. These differences are examined in Chapters Five and Six. Chapter Two places the discussion in context by defining the analyst's role

and examining changes in it over the last forty or so years. Differences between the organisations in terms of their history, structure, culture, etc. are highlighted in Chapter Four.

1.8 Summary

This Chapter has explained the subject matter of the thesis and outlined the theoretical background of the research undertaken. The thesis concerns the impact of organisational change on the roles of systems analysts and the potential impediments to bringing about change. It has been suggested that there are a number of external and internal forces that both drive and constrain organisational change and influence the process of change in roles. These factors were presented in terms of a Model which organised existing knowledge about the factors influencing the way roles develop. The Model distinguished between the "outer context", that is external forces, e.g. changes in the use of technology, the labour market, etc. and the "inner context" - internal factors, e.g. the structure and culture of the organisation, the career system, the actions of individuals, etc.

It was suggested that pressures for change may arise from the internal or external environment and create the impetus for change in roles. The Chapter used Lewin's fields of force model to explain how these factors may drive or constrain change in IS roles (Lewin, 1952). Since the forces for and against change reflect the influence of contextual factors, it was suggested that the nature and scope of roles, and the extent of change in them, will vary between organisations.

The purpose of developing the framework was to provide a basis for interpreting the impact of organisational change on the roles of group of

systems analysts employed in five large private sector organisations. Systems analysts were selected for a number of reasons but chiefly because their role requires hybrid competences and they would be a good group to examine the strength of forces for/against change. A key aim of the research was to examine the impact of change from the analyst's own perspective. The rationale for this was that the individual's perceptions helps to shape their attitudes and behaviour and may therefore be a force for or against change. Financial services and retail organisations were selected because they were likely to create the conditions conducive to developing "hybrid" analysts. The research was carried out over a six year period (1989-1995), the average length of time of the analysts had spent with their current employers, and involved examining the context in which the changes had taken place.

END NOTES

1. There has been surprisingly little research on the hybrid manager concept. Only two pieces of research have beenb carried out to date. Skyrme (1992) carried out an investigation to determine the contribution of hybrid managers and where they are most valuable. The research was conducted in eight organisations and involved carrying out interviews with senior IS and business managers. The results, published in a report called indicate that hybrids helped the organisation's use IT strategically, improved prioritisation of IT investment, improved the quality of project scoping, etc. The other piece of research on hybrids was carried out by Mercer (1991) as part of an MSc course at the University of Sheffield. Mercer collected data from ten organisations on the roles of twenty-four managers. The results, which indicate that hybrid managers are not a distinctive managerial type, are discussed in Chapter Two.

2. Friedman and Cornford (1989) acknowledge the importance of different external and internal drivers of change in computers systems development in their revised version of the Stages of Growth Hypothesis. Although they present a more sophisticated analysis of change agents than other stage theorists, the version they propose still suffers from the limitations of the Stages approach and was not considered an appropriate theoretical basis for the research.

3. Quoted on p. 13 of Gross et al (1958).

4. Ibid. p.12.

5. For a discussion of the impact of "teleworking" see Huws (1994). Huws carried out research on behalf of the Department of Employment into the extent and implications of teleworking in Britain.

6. For a discussion of social learning theory see Bandura (1977).

7. Virgo's research was based on a survey carried out by Computer Economics. The research covered 35,000 IS professionals in 500 organisations.

8. The Business Technology Education Council (BTEC) began issuing guidelines to colleges and universities on business information technology courses in 1990. This information was supplied on request by Chris Hill, Marketing Services Manager, BTEC.

9. This information was supplied by the Director of Research at BIFU. BIFU set up its own Computer Section in the early 1980's. In recent years it has seen its membership increase as a result of changes in the labour market. Figures for the Computing Section in 1995 were 1,229. This had increased to 1,309 in 1996. The Manufacturing Science and Finance Union set up its own Computer Section in 1994 to cater for the increased numbers of computer professionals wishing to join the union.

10. For a discussion of the causes of takeovers and Mergers see Alexander (1994).

11. The main elements of the career system were abstracted from a report on behalf of the IMS by Hirsh (1984).

CHAPTER TWO

The Role of the Systems Analyst: Forces For and Against Change

2.0 Outline of the Chapter

This Chapter uses the fields of force model presented in Chapter One to examine changes in the systems analyst's role. It focuses on the changes that have taken place in the analyst's role over the last forty years and the ways in which the factors identified in the model have impacted on the change process. It will be shown that the main thrust of development in the role has been towards cultivating a broader range of skills. The modern systems analyst is defined as someone who not only requires an understanding of the approaches used to develop systems but an awareness of the business, the ability to communicate with users and the skills to manage people and processes.

The Chapter draws on the Model of the Forces in the Inner Context Driving and Constraining Change in the IS Professional's Role presented in Chapter One to identify the forces that are pushing organisations in the direction of developing analysts with these "hybrid" competences. It also identifies the forces which are pulling organisations in the opposite direction towards greater specialisation. On the basis of this analysis, and the argument developed in Chapter One that the impact of change varies according to the context, it is suggested that it may be possible to distinguish those organisations where the forces for change have created hybrid analysts or analysts with strong business competences and organisations where the analyst's role is still very technically defined or becoming less specialised.

2.1 The Systems Analyst

There are many definitions of a systems analyst but most suggest that he/she is someone who develops computer applications that assist in the solution of business problems. Mason and Willcocks (1984), for example, describe the systems analyst as a "skilled worker" whose principle function is to:

> *.... design and implement computer based solutions to business problems, normally involving the high speed processing of data and information.*
>
> (Mason and Willcocks, 1984, p.22)

Similarly Maxwell (1984) [1] suggests that the analyst:

> *... performs information systems analysis and design activities, directed at creating, implementing, improving and maintaining computer-based information systems that meet the prescribed needs of the organisation and its functionaries.*

Both definitions suggest that the analyst is involved at the beginning and end of what is commonly known as the life cycle of systems development. This is an approach to developing computer systems that divides the development process into four consecutive stages: problem definition, logical analysis, design and implementation. The life cycle is based on the traditional engineering method of systems design which treats systems analysis as part of the overall process of design and development. To understand the analyst's contribution to this process, it is necessary to first of all explain the concept of systems analysis and how it fits into the computer systems life cycle.

2.1.1 The Concept of Systems Analysis

Systems analysis is an approach to problem solving that involves breaking a problem down into its component parts and then devising a course of action which will lead to an appropriate solution. The theoretical basis of systems analysis can be found in General Systems Theory, Systems Engineering and the work of the RAND Corporation in America. General Systems Theory was outlined in Chapter One. Basically, it suggests that any organism can be viewed as a "whole" or "system" made up of interdependent parts or subsystems (Bertalanaffy, 1971; Jackson, 1991). The interdependence of these subsystems means that change in one part of the system may lead to change other parts of the system, thus bringing about change in the whole system.

The idea that subsystems are interlinked underpins the discipline of Systems Engineering, which developed systems analysis as part of its methodology for solving engineering problems in the 1940's. Systems Engineering has been defined as:

> *... the science of designing complex systems in their totality to ensure that the component subsystems making up the system are designed, fitted together, checked and operated in the most efficient way.*
>
> (Jenkins, 1972) [2]

The methodology the systems engineers devised was based on the traditional engineering approach to design. This divided the process of development into a number of stages, including: problem definition; selection of objectives; systems analysis; systems selection; systems development and current engineering. It is this model of the development process which underlies the life cycle of computer systems

development described earlier. Systems analysis is, as suggested, part of the life cycle.

The main tasks of systems analysis are based on the approach to problem solving developed by the RAND Corporation in the 1950's. The latter was set up by the US Government in 1947 to provide advice on military and other government matters and used systems analysis to solve a wide range of technical and non-technical problems. Quade and Boucher (1968) have described the type of analysis practised by the Corporation [3]:

> *One strives to look at the entire problem, as a whole, in context and to compare alternative choices in the light of their possible outcomes. Three sorts of enquiry are required ... There is a need, first of all, for a systematic investigation of the decision-makers objectives and of the relevant criteria for deciding amongst the alternatives that promise to achieve these objectives. Next, the alternatives need to be identified, examined for feasibility, and then compared in terms of their effectiveness and cost, taking time and risk into account. Finally, an attempt must be made to design better alternatives and select other goals if those previously examined are found wanting.*

When computers were introduced into business organisations in the late 1950's, the RAND method appeared to offer a logical approach to analysing the requirements of the new systems. Systems analysis in a computing environment is thus based on the steps described above, i.e. definition of the problem, analysis of the existing system, appraisal of alternatives, system selection and design of the new system.

2.1.2 The Life Cycle of Systems Development

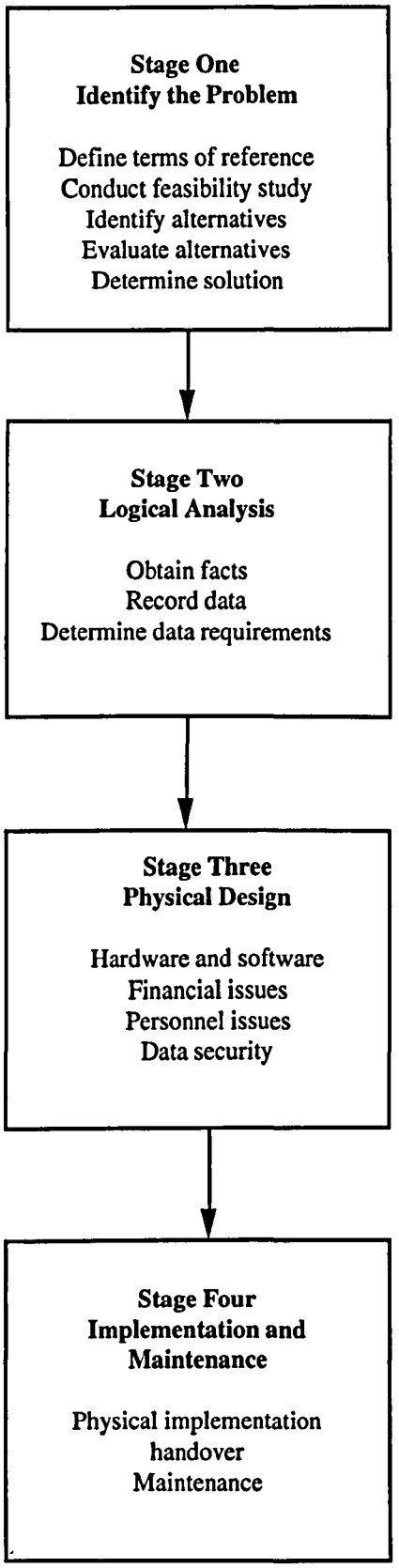
The way in which these activities fit into the life cycle of systems development, and the role of the analyst in implementing them, is best illustrated by describing the main stages of the systems development process. Figure 3 presents a model of the life cycle [4]. It will be seen from this that the first stage begins when someone in the organisation, usually a business manager, spots a problem that could be solved by introducing a computer. He/she will consult with the systems analyst and define the terms of reference for a feasibility study. The study will determine whether a computer is appropriate and, if so, evaluate the alternatives and recommend a solution.

The second stage of the model involves logical analysis of the system. The systems analyst will carry out a full systems study which provides a detailed description of the old system and the information processing needs of the new system, thus enabling a logical model of the proposed system to be built. Once this has been completed and a requirements specification has been produced, a complete working system is designed. The design will take into account not only the physical requirements of the system but also the particular preferences of users, security issues and financial constraints on development.

When the system has been designed, a programmer or team of programmers will construct the system. The analyst is unlikely to be involved in the detailed coding, but may monitor progress and assist in designing and trialling sets of test data, training staff in the operation of

Figure 3

THE SYSTEMS DEVELOPMENT LIFE CYCLE



the system and changing over to the new system. The changeover involves running the new system with real data from actual transactions usually while the old system is still processing old transactions. If this is successful, the system is "signed off" and responsibility is handed to whoever is in charge of the day to day running of the operations. The final part of implementation, maintenance, involves reviewing the performance of the system periodically to make sure that it continues to meet the changing requirements of the business. This may be carried out by the analyst but is more likely to be the responsibility of experts in systems maintenance (Awad, 1985; Mason and Willcocks, 1994).

On the basis of what has been said so far, it appears that the systems analyst is someone who *investigates business problems and then develops and implements computer-based solutions to solve those problems.* To carry out their role, the key competence is an understanding of the approaches used to develop systems. The role also requires the following competences identified by Mason and Willcocks (1994, p. 25):

2.1.3 Competences of a System Analyst

1. Technical knowledge of all hardware that is currently available and its performance characteristics.

2. Familiarity with the software and languages that the programmers will be using.

3. The ability to use established techniques in new and imaginative ways when creating a design.

4. A comprehensive knowledge of current business practice in a wide variety of industries.

5. The ability to communicate complex ideas to senior staff and top management who may have little experience of those areas.

6. The self-discipline to follow a methodical approach but also enough flexibility to take advantage of unexpected opportunities.

7. The ability to interact successfully with staff at all levels when investigating a system, and to deal with any misgivings or opposition arising in a constructive way.

Mason and Willcocks' list suggests that systems analysts require a combination of technical, business and communication skills. Most of the literature on analysts published over the last thirty or so years, however, indicates that they have tended to be strong in the technical areas and much weaker in the non-technical. This has often been cited as a factor constraining the effective implementation of systems and has led to repeated exhortations to develop analysts with a more business oriented approach to systems development. A letter published in the Computer Bulletin in the late 1960's, for example, decried the "electronic witchdoctor attitude" of the systems analysts and asserted that they displayed the "arrogance of ignorance outside the computer centre" (Efial, 1967). Twenty years later, Maxwell wrote at length about the need for systems analysts to develop a better desk-side manner (Maxwell, 1988). A review of the computing literature over the last thirty years suggests that the major force for change in the role of the analyst, has been the desire to cultivate a broader range of skills (Exton, 1970; Smythe, 1971; Scotese, 1971;

Dodsworth, 1977; August, 1976; Manchester, 1988; BCS, 1990; Meiklejohn, 1990; NCC, 1994). The next section, which examines the evolution of the systems analyst's role, considers this argument in more detail and suggests that it points to a process of "hybridisation".

2.2 Evolution of the Role

Pettigrew's research on the emergence of systems analysis as an occupational specialism suggests that systems analysis emerged as a discrete occupational specialism in the late 1950's (Pettigrew, 1973). His findings make it clear that companies began employing "specialists" to carry out systems analysis because users found the programmers who originally carried out systems analysis as part of the life cycle, too technically oriented. The role of the systems analyst arose, therefore, to "bridge" the communication gap between technical specialists and users and to help the business areas derive benefit from the new technology. Articles from the period suggest, however, that the role tended, in practice, to be quite technically defined. Lendon (1970), for example, suggests that the systems analyst "contributed his analytical and design skills" but did not advise on the type of reporting that was produced. Pettigrew (1973) concurs, pointing out that though analysts had been employed to make a business input to the systems development process, their role was very limited (Pettigrew, 1973).

Towards the end of the 1960's, the literature indicates that the role broadened and became more business oriented. Research by Mumford on the sources of job satisfaction of analysts in a number of companies indicates that users wanted "competent systems analysts" who were fully aware of the commerial implications of systems development:

> *... Users wanted analysts to be experts in the business procedures of their own companies, sympathetic to the problems of line departments and aware of the culture constraints of the environment in which they were operating.*
>
> (Mumford, 1972, p. 40)

Crocker's research on the roles of analysts in thirteen firms in the late 1970's, also suggests that analysts were expected to be familiar with the workings of the business:

> *Systems analysts employed in organisations with their own computer departments were required to have intimate knowledge of the functions of the organisation, know the bounds of the particular hardware configuration and be able to carry out the systems functions deemed to be the responsibility of the computer department.*
>
> (Crocker, 1977, 3.5)

In addition to needing business skills, analysts also required general management and communication skills. The ability to plan, organise and schedule work, to control budgets and manage staff was necessary to cope with the growing number of systems development projects that were being commissioned in the business areas and to manage staff as the size of data processing departments grew. In an article published in the mid 1970's Kennedy-McGregor emphasises the importance of management training to cope with these developments.

> *Traditionally, the role of the systems analyst has been that of technical expert ... this is changing ... an analyst is now a manager ... He is responsible for advising on spending vast sums of money. He uses thousands of pounds worth of machinery and he may have a large staff working for him. He must, in future, be trained as a manager as well as an expert or companies will continue to have unfinished projects and expensive white elephants.*
>
> (Kennedy-McGregor, 1976, p.59)

Evidence that the role continued to become more business focused in the 1980's can be found in various skill surveys and reports. A survey by Cheyney, Hale and Kasper, for example, indicates that technical skills were still the main requirement of the role but that human relations skills and logical problem-solving skills were becoming increasingly important:

> *The trend for systems analysts/designers is towards increased knowledge of people and problem-solving skills, and away from developing application software.*
>
> (Cheyney, Hale and Kasper, 1989, p. 335)

By the early 1990's, the computing literature suggests that the systems analyst was turning into a business analyst. Kondstadt (1991), for example, argued that systems staff were being transformed into business analysts with "the ability to improve overall business results instead of simply providing solutions". Senese (1993) adoped a similar view, suggesting that as business analysts, systems staff must know and do things that would not have been considered before:

> *They must have a thorough understanding of systems management, including the systems development life cycle. They must be proficient at project management, technical resource management and vendor management. They must understand functional disciplines, be able to speak cross-functionally and develop enterprise vision.*
>
> (Senese, 1993, p.33)

Of course, it could be argued that this is what systems analysts were always supposed to do: the use of the word "business" as opposed to "systems" analyst is important, however, because it implies a change in the status of the analyst.

Table 1 provides a summary of the key changes in the systems analyst's role from the late 1950's to the present day.

Table 1: Key Changes in the Systems Analyst's Role

Date	Key Requirements
Late 1950's- late 1960's	Systems analysts were recruited to act as a communication link between data processing section and other business areas but their role tended to be technically defined.
Late 1960's - late 1970's	The systems analyst now requires a combination of technical and management skills. There is growing awareness of the need for good user skills and an understanding of the business.
Early 1980's - late 1980's	The systems analyst requires good communication skills and an awareness of the business areas they are serving
Early 1990's -	The systems analyst requires a mixture of technical, managerial and business skills

The changes outlined in the Table suggest that the role has become "hybridised", i.e. less technically defined and more business-oriented. The word "hybridised" derives from Earl's use of the term "hybrid manager" in the early 1990's to describe people:

> *... with strong technical skills and adequate business knowledge or vice versa ... 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.*
>
> (Earl and Skyrme, 1990, p.6).

Hybrid managers are usually defined as a "new breed" with distinctive competences (Earl and Skyrme, 1990; Cane, 1990). The suggestion that the analyst's role has become hybridised challenges this assumption in the sense that it implies that the hybrid role, and the competences required to carry it out, are not necessarily the province of a particular group. Research by Mercer (1991) which reveals that many IS professionals and users are carrying out a hybrid role, supports the idea that hybrid competences may be widely diffused in IS.

The concept of "hybridisation" differs from the hybrid manager concept not only in that it implies different roles may have different blends of business/technical competences but also in that it implies a process rather than a state of being. A key problem with the hybrid manager idea is that it does not allow for change - the boundaries of the role are specified by Earl and Skyrme (1990) and documented by the BCS in its Industry Structure Model (BCS, 1991). In reality, roles change - they can become more or less hybridised. Their boundaries are not fixed.

Another way of expressing this point - and explaining the hybridisation concept - is to imagine that there is a continuum of roles in IS extending from those that are very technically oriented to those that are very business-oriented. Roles may move in either direction. The closer a role moves to the middle of this continuum, the greater the degree of hybridisation. According to the IS literature, the analyst's role started off close to the specialist end and is now closer to the middle. It may of course move back in the opposite direction. The point about hybridisation is that it recognises this notion of "movement".

If the analyst's role has moved from the specialist end of the continuum to the middle, the question arises of what effect this has had on other roles in IS and, conversely, what effect changes in other roles have had on analysts. In Chapter One it was suggested that changes in one role will affect other roles. With regard to the effect changes in the analyst's role has had on others, it could be argued that the process of hybridisation has increased the degree of specialisation in other roles. Programmers, for example, may have moved in the opposite direction to analysts along the hybrid continuum.

Changes in the programmer's role would also affect systems analysts. If programmers have moved towards the business end of the hybrid continuum, analysts may have moved in the direction of the specialist end. The trend towards converging the analyst and programmer roles could be used to support this argument since it "classes" analysts with a group that has traditionally been regarded as technically specialised. Another factor pushing the analyst's role back in the direction of the specialist end of the continuum may be the emergence of business analysis as a separate occupational category. Although Kondstadt (1991) suggests

that systems analysts are turning into business analysts, the latter are treated as a separate occupational category by the professional bodies. They may thus be taking over the business aspects of the systems analyst's role in the same way that the systems analysts took over the business aspects of the programmer's role in the 1960's. If both programmers and business analysts are appropriating aspects of the systems analyst's role, the latter may be fragmenting and the "systems analyst", as a distinct occupational group, could be in danger of extinction.

There is some empirical support for the idea that systems analyst's role has become more technically defined. Todd et al (1996) carried out a survey of advertisements for IS professionals over a twenty year period ((1970-1990) and found that there was a strong emphasis on technical knowledge requirements, suggesting that employers are more interested in analysts' technical skills than they are in their business/management skills. Although this emphasis on technical skills may simply reflect the fact that employers take it for granted that today's analysts will be business literate (a reflection, perhaps, of changes in the education system) the findings point to the possibility that the role of the analyst may not be as business oriented as generally supposed.

While the findings of the research suggest that the analyst is still a technical specialist, Todd et al do not take into account the influence of contextual factors. In Chapter One it was suggested that the scope and content of roles in IS, the skills required to carry out a particular role, and the relationship of one role to another may vary between organisations. Thus, the analyst's role may be broadly defined in one organisation but quite technically defined in another. What aspects of the context, then, account for these differences? The next section considers this question in

relation to the forces in the inner and outer context that may be driving organisations in the direction of hybridising the analyst's role and forces that may be pulling them in the opposite direction.

2.3 Forces For and Against Hybridisation

2.3.1 Forces in the Outer Context

All the forces for change in the outer context identified as important in Chapter One may help to explain the trend towards "hybridising" the analyst's role. Thus the growth of domestic and international competition over the last few decades may have prompted organisations to take steps to become more efficient and effective. Improvements in technology and the falling cost of systems over this period would have helped organisations to achieve these goals. The introduction of networked PC's and user-friendly software in the 1980's would have given managers the technical capability to decentralise IS to the business areas, thereby increasing pressure for the IS function to become more responsive to user needs. The introduction of new approaches to systems development such as Rapid Application Development (Martin, 1991) and Prototyping (Floyd, 1984) would have added pressures in this direction since they enable users to become more involved in systems development. The trend towards outsourcing may be another factor pushing organisations in the direction of hybridisation as staff who are not "out-housed" may need to be more flexible and broadly skilled.

Changes in the education system may also have been a force for hybridisation. Management in organisations that have wanted to inject greater business awareness into IT have been able to do so by recruiting

people who have taken one of the many courses now available in the business applications of computing. Changes in the educational system may therefore have been stimulating change in the quality and range of skills available in the external labour market. The professional bodies' endorsement of the need for business competences would add to pressure to develop hybrid competences. The combined effect of these external forces may be to encourage organisations to broaden the roles and skills of analysts and other occupational groups in IS.

As suggested previously, there may also be forces in the outer context pulling organisations in the opposite direction. With regard to the growth of competition, for example, the amount of competition experienced, and its impact, will vary between sectors and organisations within the sector. Organisations operating on a relatively stable environment may not be under the same pressure to "hybridise" as organisations in a volatile environment. Even if they were, this would not *inevitably* lead them to pursue strategies that encourage hybridisation.

In the same way that changes in the business environment will not *inevitably* lead to identical changes in strategy, management will not automatically invest in every new technology that promises to transform the business. If existing technologies continue to serve the organisation well, management may see little point in switching to costly new systems. There may also be reluctance to experiment with new approaches to systems development, even if these do extend the possibility of greater user involvement. Cost might be a constraint on outsourcing - if it is cheaper to in-source and more staff stay with the organisation, there is greater scope for role specialisation in large organisations. The trend away

from outsourcing may thus, indirectly, be a factor encouraging specialisation.

Changes in the education system are a force for change in the long-term. Although improvements in the provision of computing in schools and the introduction of hybrid courses are likely to improve the calibre of those occupying the analyst role (and user roles), it will be many years before the full impact is felt. Also, although there will be more graduates entering IT with a background in business and technology, employers have traditionally preferred to recruit people with commercial experience (Pearson et al, 1988). Changes in the education system may therefore not be as powerful a force for hybridisation as supposed.

In the previous section it was suggested that the professional bodies had been keen proponents of hybridisation. While it is true that the BCS has championed the hybrid cause, the original Industry Structure Model made a clear distinction between the analyst/programmer and business analyst roles. Both include a mixture of technical and business competences but dividing the roles in this way (and treating hybrid managers as a separate occupational group) may encourage specialisation. The other external group identified as important in Chapter One, the unions, have had little to say on the hybrid issue but it is possible that they may not see it in their members' interests to advocate abandoning the specialist skills that make them a valuable asset in organisations.

2.3.2 Forces in the Inner Context

As suggested in Chapter One, organisations do not react passively to changes in the external environment. Although there have been forces in

the outer context pushing organisations in the direction of hybridising the analyst's role, the way roles change is contingent on the organisation's reaction to these changes and more general changes within the organisation. This section therefore examines some of the factors in the inner context that may be a force for/against hybridisation.

2.3.2.1 Forces for Hybridisation

The first force for change identified in the Model of the Forces in the Inner Context Driving and Constraining Change in the IS Professional's Role presented in Chapter One was the company's corporate and IS strategies. Changes in corporate strategy, arising from pressures in the external environment or general changes within the organisation, may be a force for hybridisation where they increase the importance of technology as a means of realising business goals. If management is planning to diversify into new business areas, for example, and invests in new systems to enable this change, analysts will need to understand not only the technology but the background to the changes, the nature of the business into which the organisation is moving, the implications for existing systems, etc.

Changes in human resource strategy are usually required to support changes in corporate strategy. The latter may also, therefore, be a force for hybridisation. If the organisation is seeking to become more competitive by diversifying into new business areas, changes in the career system may be necessary to make the venture a success. This may mean recruiting staff with a background in the area into which the company is moving, providing training in both technical and non-technical skills, changing reward systems to encourage compliance, etc.

Another force for change identified in the Model was the approaches used to develop systems. As suggested previously, a number of new approaches have been introduced in the last ten or fifteen years which require frequent contact with users and would, therefore, be a force for hybridisation. Prototyping, for example, gives users the opportunity to contribute directly to the development process. In this approach a mock-up of the final system is produced very quickly to give the user an idea of what the system will look like (Floyd, 1984; Friedman and Cornford, 1989). The fact that the analyst and user have to work together to design the system may encourage the cross-fertilisation of skills.

The supply of labour was also identified in the Model as a force for change. In Chapter One it was suggested that shortages of skills in the external labour market have prompted organisations to recruit users in IS roles, thus acting as a force for hybridisation. Pettigrew's research suggests that it was the paucity of business-literate technical professionals which prompted organisations to recruit users into analysis in the early days of computing (Pettigrew, 1973). Users are likely to have a stronger focus on the business than technical professionals and may have given the role a greater business orientation. The recruitment of more highly educated people, and graduates with business/technology degrees following changes in the education system may also have encouraged the trend towards hybridisation.

Changes in organisational structure may be an important force for hybridisation. These changes may be a response to pressures in the external environment such as increased competition or a result of internal pressures for change. In Chapter One it was suggested that large organisations tend to encourage role and task specialisation (Pugh et al,

1968). In organisations which have downsized, however, the resultant flatter structure may mean that analysts are required to carry out a broader range of tasks and therefore need a wider range of competences. Some of the changes in the structure of the IS department/division referred to in Chapter One, such as the trend towards devolving responsibility for IT to users, may also be a force for hybridisation. In organisations that have decentralised IT to the business units but retained a centralised IS unit, systems analysts may be required to act as the main link between the technologists and users working on a particular project. This role clearly requires very good communication and interpersonal skills. Where analysts have been physically redeployed to work in the business units, or where they report to a business manager, they will have received greater exposure to the business areas. Again, this is likely to have increased analysts' awareness of the need for business and communication skills. Working in, or reporting to, the business units may also influence the analyst's perception of where their loyalties lie. If they perceive that their loyalties lie with the business, this may act as a spur to develop business competences.

Apart from, or in addition to, decentralising their IT facilities, some companies have opted to use the services of outsourcers. As suggested earlier, demand for outsourcing or facilities management has increased considerably over the last few years (Price Waterhouse, 1993/94). This trend would have important implications for analysts. Organisations that outsource may make some staff redundant or redeploy them to work with the outsourcer. There is no research to indicate whether analysts are more vulnerable to outsourcing than other professionals but it seems likely that staff who are highly skilled or who have specialist knowledge of the organisation are more likely to be retained in house. Those members of

staff who remain "in house" will probably have to be more versatile than they were before. Again, this would be a force pushing organisations and analysts in the direction of hybridisation.

Cultural factors were identified in the Model as a potential force for change. All the recently published skills surveys stress the need for cultural changes within organisations to support hybridisation (BCS, 1990; City University, 1991). The BCS (1990), for example, emphasises the importance of introducing "cultural shifts towards being an open and learning organisation and away from a culture of blame and scapegoats". In organisations where management introduce initiatives to increase interdepartmental communication, co-operation and learning, it could be argued that the roles and skills of analysts may become more broad-based and business-oriented.

Changes in an organisation's occupational structure may be another force for hybridisation. These changes may be a result of the trend towards downsizing, decentralisation or outsourcing described in Chapter One. Where the effect is to blur the boundaries between different occupational groups and create a more flexible career structure, the analyst's role may become more broad-based. Although earlier it was suggested that the emergence of the business analyst role may be a factor increasing the degree of specialisation in the analyst's role, it could equally be argued that it gives analysts the opportunity to side-step into business analysis. This would be a fairly easy transition to make since the business analyst's role, as defined by the British Computer Society, is very similar to the traditional systems analyst. The BCS defines a business analyst as someone who:

> *... carries out investigatory, feasibility and analytical studies based on a thorough understanding of the application area under review, and the needs of the user, to produce viable outline specifications in preparation for the construction of information systems.*
>
> (BCS, 1991)

This definition implies that the business analyst is perhaps more concerned with the "up front" work than the systems analyst and is less involved in the technical aspects of development. There are clearly similarities between the roles, however, and it may be difficult in practice to draw clear occupational boundaries between them

Managerial strategies of control were identified in Chapter One as an important influence on roles. It was suggested that when there are skills shortages in the external labour market, and staff are able to change jobs relatively easily, managers may be more inclined to use strategies that encourage responsible autonomy. There have been persistent shortages of skills throughout the history of computing but NCC reports indicate that these have been particularly acute for analyst/programmers and systems analysts over the last few years (NCC, 1990, NCC, 1995). Since this, presumably, places the analyst in a fairly strong position, it may encourage management to use strategies that promote responsible autonomy. If the analyst population is motivated to broaden their role, and if it is in management's interest to encourage this, management strategies may be a force for hybridisation in the analyst's role.

The occupational community was another force for change identified in Chapter One. The latter may encourage hybridisation where there is collective recognition of the importance of hybrid competences. In

organisations where the IS department/division is flexible and task-oriented; where there is a positive attitude towards the business and change, the occupational community might be a force that supports initiatives which encourage hybridisation. In organisations where the IS division is wedded to traditional values, it is still possible that the occupational community may become a force for hybridisation if failure to support change jeopardises the survival of the community.

Users may also, under certain circumstances be a force for hybridisation. In Chapter One it was suggested that changes in the use of technology combined with changes in the business environment had encouraged the spread of computing and increased the power of users as a pressure group for change. It will be recalled that Pettigrew's research on the roles of early systems analysts suggests that systems analysis emerged as a specialist occupational category because of pressure exerted by users who found it difficult to communicate with programmers (Pettigrew, 1973). Another example of the impact of user pressure in forcing change in the role is the convergence of the programmer and analyst job functions referred to earlier. The principal motive for this convergence was, in many cases, to make programmers more responsive to the needs of users in the business areas (Friedman and Cornford, 1989).

In Chapter One it was suggested that a key factor in bringing about change in roles was the career system. If organisational procedures for recruiting, training, appraising, promoting and retiring staff change, this may have a significant impact on the individual's perception of their role and hence on their behaviour. The career system may be a force for hybridisation if management use it to develop business awareness/competences amongst technically oriented staff. Recruitment may facilitate hybridisation where

management select analysts who have general education qualifications, hybrid qualifications or actual experience in the business.

Training, the second element of the career system, may be used to develop hybrid competences where management rewards analysts for taking courses that develop business awareness or user support skills. The procedures for assigning staff to roles can be a force for hybridisation if analysts are given the opportunity to work alongside users in project teams, to shadow users in the business areas for short periods or to spend time in the business areas working in a line capacity. Appraisal can be an important means of developing hybrid competences where the criteria for assessing analysts includes not only technical competences but also business awareness, user support skills, etc. The procedures used to select candidates for promotion may establish the importance of hybrid competences where they reward analysts who have distinguished themselves in business/management as well as technical areas. If the career system changes in the way described previously, management will send a powerful message to analysts that the organisation recognises and rewards hybrid competences.

Changes in the career system are unlikely to be effective if the analysts have no interest in the business or are not strongly motivated to advance their career. A final force for "hybridisation", therefore, may be the aspirations of the analysts themselves. The few anecdotal accounts of American firms that have redeployed analysts to work in the business units, suggest that some systems analysts do enjoy contact with users and finding out about the business. One systems analyst who had been employed as an accounts manager in manufacturing company in the US identifies strongly with the business and is quoted as saying:

> *I feel I am earning the respect of the regional sales managers, that they don't just think of me as a techie who can help them out of a jam but rather as someone who is more on the ball.*
>
> (LaPlante, 1990, p. 91)

In Kondstadt's article on the evolution of systems analysts into business analysts, it is suggested that "At the core of this change for technologists are a shift in perspective and a desire to expand professional horizons" (Konstadt, 1991). It could well be, then, that many systems analysts would welcome the opportunity to expand their role and may take active steps both to "expand their professional horizons" and to safegaurd their "territory" from other groups as occupational boundaries begin to blur in the "leaner, flatter and more flexible" organisations of the 1990's. Changes in the outer context, particularly changes in the education system and the the actions of the BCS in promoting awareness of the need for hybrid competences may be important in influencing the analyst's orientation to their role.

2.3.2.2 *Forces for Specialisation in the Inner Context*

The organisation's corporate, IS and human resource strategies were previously identified as a force for hybridisation. They may have the opposite effect where the organisation is seeking to cut costs; where there is heavy reliance on old systems; where old and new systems are being run in parallel; or where the type of systems introduced are are not particularly user friendly. Organisations that are cutting costs may be reacting to external pressures such as the growth of competition. Organisations that are using old systems may be operating in a fairly stable environment where IT is not essential to survival. Unless management take

preventative action, analysts who work in either type of environment may develop a fairly narrow range of technical skills.

The organisation's strategy for managing human resources may be a constraint on hybridisation if the career system continues to endorse technical values. This may happen for a variety of reasons. It may be that the organisation has difficulty aligning its corporate, IS and human resource strategies in which case changes in human resource policy may come about slowly or fail to support changes in IS. Another problem may be that there are cultural constraints on change. Since the career system which develops in an organisation is likely to reflect its cultural beliefs, failure to change the latter may slow the process of implementing changes in the career system (Hirsh, 1984). Whatever the precise cause, if the organisation's policies for recruiting, training, appraising, assigning, promoting and retiring IS professionals appear to reward technical expertise and fail to provide opportunities to develop a wider range of skills, the analyst's role is likely to reflect these values and remain quite specialised.

Another force for specialisation may be the approaches used to develop systems. Strict adherence to structured methods, for example, may reinforce the degree of technical specialisation within the role (Friedman and Cornford, 1989). While the introduction of new approaches to systems development may be a force for hybridisation because they require analysts to work more closely with users in the business areas, the very fact of having to "learn" these new approaches would increase the degree of specialisation within the role. Not everyone could acquire the knowledge and skills necessary to implement Rapid Application Development, for example.

The supply of labour may be an important factor pulling organisations in the direction of technical specialisation. Although, as suggested earlier, there are more graduates with an understanding of the business applications of computing, it is not clear what, if any impact these graduates have had in organisations. Also, many of those recruited into systems analysis in the early years of computing were "promoted" from the ranks of programmers and brought with them a strong technical orientation. This may well have influenced the way the role has developed and users' perceptions of systems analysts. While recent recruits into systems analysis may have taken courses that aim to develop the communication and business skills of potential analysts, those who were recruited when these courses were not available may continue to imbue the role with a strong technical orientation.

The practice of recruiting systems analysts from a technical background is a reflection of the organisation's attitude towards IT. Organisational factors, particularly the structure and culture of a company may therefore be constraints on developing "hybrid" analysts. Large, bureaucratic organisations that have been established a long time may pursue policies that encourage technical specialisation. While corporate downsizing has cut a swathe through managerial ranks and technology can certainly facilitate ways of working that reduce the number of people employed at any one location, large organisations continue to exist employing many thousands of people, on-site, and in structures that could still be described as bureaucratic and functionally specialised. It may be difficult to develop hybrids in this type of environment. In organisations which are large and functionally specialised the systems analyst's job may be defined as a specialist activity requiring particular technical skills.

Although changes in technology and the business environment have encouraged the trend towards decentralising computing, organisations which are large and functionally specialised may still retain a centralised IS department, staffed by large numbers of IS professionals. Where IS professionals are physically grouped together, a strong occupational culture may develop. If the IS department/division has been established a long time, it may value technical as opposed to business skills. The occupational structure in such an organisation may also reinforce traditional divisions of labour, value technical skills and to seek to retain professional expertise within IS. Hybrids are most likely to develop in organisations with flexible occupational structures, where the culture values broad-based skills (BCS, 1990). The analyst who works in an organisation with a long established, centralised IS department may develop a broad range of technical skills (assuming that there is scope for intra-functional mobility) but may not have substantial experience of the business.

In the previous section, management strategies that encourage autonomy were identified as a force for hybridisation. It was suggested that relatively favourable labour market conditions may strengthen the position of the analyst and encourage managers to adopt strategies that favour hybridisation. It could equally be argued that in the last ten years or so, management has pursued strategies that have produced the opposite effect. In Section 2.2 it was suggested that the merging of the analyst and programmer roles and the growth of business analysis as a separate occupational category may have reduced the scope of the role. Business analysts, particularly, are performing tasks that would have been carried out by the "traditional" systems analyst, e.g. conducting feasibility studies,

defining requirements, evaluating the results of the implementation. If business analysts are carrying out tasks similar to the "traditional" system analyst, it could be argued that the latter's role has been split up and that it has become narrower and more technically defined.

Managers are not the only group whose actions may have increased the degree of specialisation within the role. The occupational community may also be a force for specialisation. Pettigrew's case study of the emergence of systems analysis as a specialist occupation suggests that occupational groups will often seek to expand their professional horizons by taking over areas of responsibility from other groups. Pettigrew describes how systems analysts in the early 1960's consciously sought to appropriate tasks carried out by the programmers. When the first system was installed in the company in the late 1950's, the analysts had responsibility for only one area - changeover; by the time the next generation of systems had been introduced - the early 1960's, they were jointly responsible for most of the technical areas and had control of the up front work (Pettigrew, 1973). It is possible that business analysts might now be seeking to descope the role of analysts in the way that analysts descoped the role of programmers in the 1960's.

Analysts are unlikely to become deskilled if the users in the organisation for which they work are not technically competent. While it has been suggested that user pressure may be a force pushing analysts in the direction of acquiring business skills, user anxieties about computer technology and the rapid pace of technological change in some organisations may mean that users are more interested in the technical competences of the analysts than their business or interpersonal skills.

The career system is another factor that may encourage specialisation. If the organisation recruits analysts from the ranks of specialists and provides little training in business or general management competences, the analyst's role is likely to remain quite specialised. If there are few opportunities to move around in the IS department or division and secondment to the business areas is unheard of, systems analysts may develop a narrow range of skills and an insular view of the IS department/division. If the criteria used to appraise and promote analysts reward mainly technical competences and redundancies in the organisation fall heaviest amongst those with predominantly administrative/management skills, then the organisation sends a very clear message to analysts that it values them mainly for their technical competences.

A final factor which may reinforce specialist tendencies is the attitudes of the analysts themselves. Previously, it was suggested that there may be good reasons why analysts would want to broaden their role and develop the business side of it. There may be equally good reasons why they may not wish to do this. The possession of technical skills may be viewed as a more marketable commodity than business skills. IS professionals, historically, have been paid high salaries for the possession of expert technical knowledge (Friedman and Cornford, 1989). Thus, there may be no economic advantages in becoming more business oriented. Another reason analysts may prefer to remain "technical specialists" is simply that they do not define themselves as hybrids or business executives. Although very dated now, Mumford's research into the roles of analysts and programmers which showed that analysts tended to view their role in technical terms, suggests that the individual's orientation to their role

may be a powerful force for specialisation in certain circumstances (Mumford, 1972).

2.3.3 The Current Status of the Role

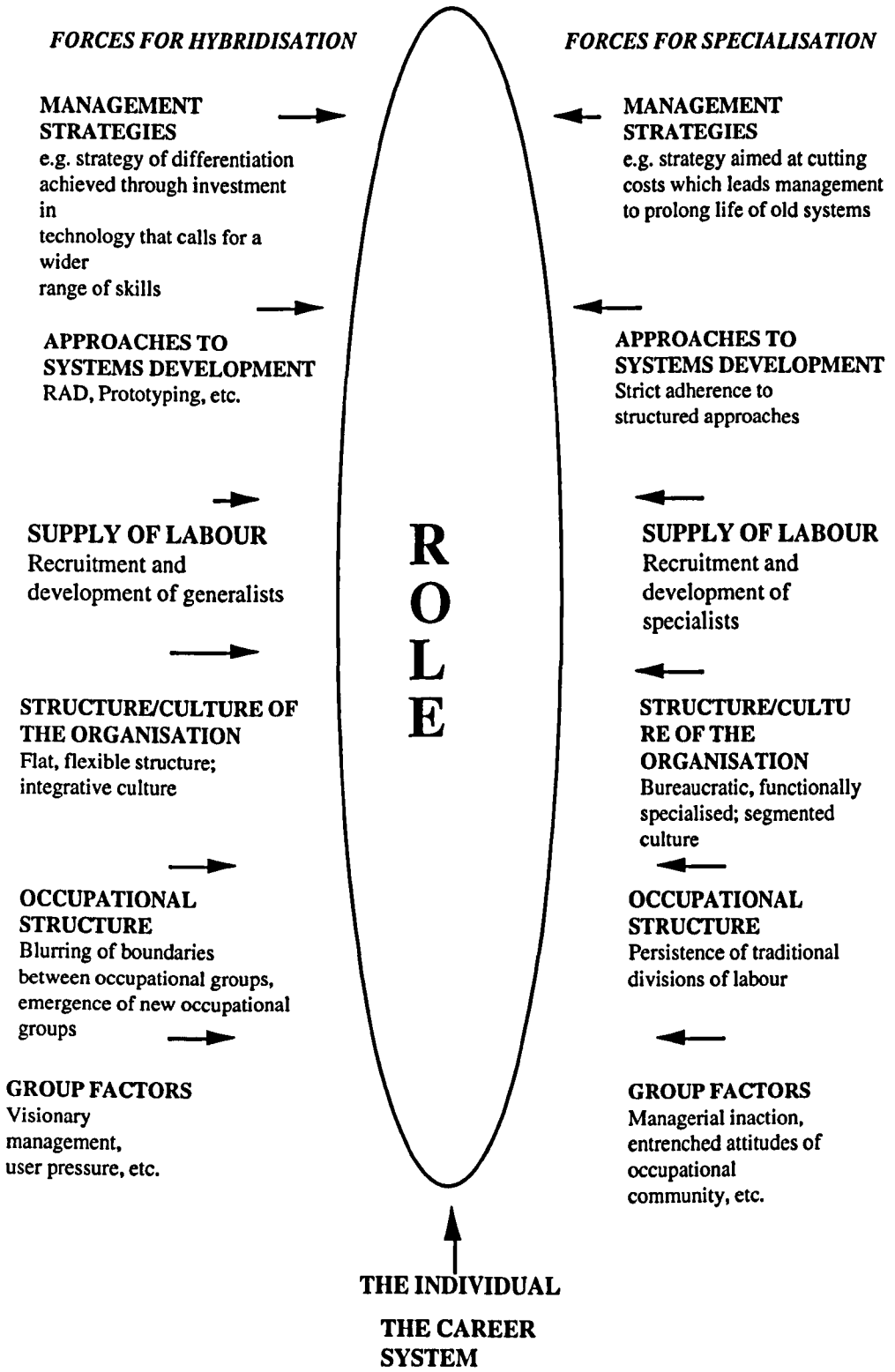
The foregoing discussion has suggested that the main thrust of development in the analyst's role has been towards enhanced business and general skills. Throughout the 1960's, 70's, 80's and now in the 1990's, pressures have been exerted on analysts to become more aware of the business applications of new technology and to develop solutions that enable organisations to operate more efficiently and effectively. The forces in the inner context pushing analysts in this direction are summarised in Fig 4. It has also been suggested that there are forces "pulling" in the opposite direction, towards increased specialisation. These forces are also summarised in Fig 4.

It will be noted that, as in the Model presented in Chapter One, the individual and the career system are positioned in between the forces driving and constraining change. This is to indicate that the analysts may either push for, or resist change in their role, and that the career system, or elements of it, may be a force for or against change, depending on the circumstances.

The fact that it has taken twenty-five years to develop analysts with hybrid skills indicates that there are powerful forces constraining change and encouraging a high degree of specialisation. These constraints on change are examined more fully in Chapters Four, Five and Six which present the

Figure 4

A MODEL OF THE FORCES IN THE INNER CONTEXT DRIVING AND CONSTRAINING HYBRIDISATION IN THE ROLE OF THE SYSTEMS ANALYST



main findings of the research.

2.4 Summary

This Chapter has defined the systems analyst, examined the main changes that have taken place in the analyst's role over the last forty or so years and related the findings to the theoretical arguments developed in Chapter One. The systems analyst was defined as someone who investigates business problems and then develops computer-based solutions to solve these problems. To carry out this role he/she requires an understanding the approaches used to develop systems and a range of business, technical and managerial competences. The IS literature suggests that the role has gradually broadened over time and the systems analyst is now more of a business analyst or a "hybrid" requiring a range of technological, business and management skills.

Using the arguments developed in Chapter One, it has been suggested that the way the analyst's role is defined or the "degree" of hybridisation depends on the context. In any organisation, there will be forces in the outer and inner context pushing for change in the analyst's role and forces constraining change. Since the way a role is defined depends on the contextual factors, the idea that all systems analysts are turning into business analysts/hybrids was questioned. It was suggested that differences in context may mean that the role of the analyst may be quite technically defined/specialised in one organisation and business-focussed in another.

END NOTES

1. Quoted in an article by Hunter (1994).

2. Quoted in Jackson (1991) p. 74.

3. Quoted in Checkland (1981), p. 137.

4. This model of the life cycle was based on a more detailed version by Mason and Willcocks (1994).

CHAPTER THREE

Research Methodology

3.0 Outline of the Chapter

This Chapter describes the methods selected to carry out the research and explains why it was felt that these methods were most appropriate. In essence, the Chapter suggests that there were two methods that could have been chosen - the survey or the case study method. The latter was selected because it satisfied all the criteria established to investigate the research question. While there are disadvantages with the case study method, it was felt that these could be overcome if the research was carefully designed and executed. The Chapter also describes the methods used to collect and analyse the data. In terms of data collection, the research relied on questionnaires, interviews and company literature. The data collected using these means was then analysed in terms of the key questions of the research. Although the procedures used to investigate the research topic enabled relevant data to be gathered, it is suggested that problems were encountered ensuring the reliability and validity of the data and obtaining access to company statistics. The Chapter describes these problems and how they were overcome.

3.1 The Alternatives

It will be recalled that the main aims of the research were to explore the impact of organisational change on the role of the systems analyst; to examine the analyst's perception of the change and to determine whether there were any forces that were slowing down or inhibiting the

hybridisation of the role. The methodology selected therefore had to satisfy a number of criteria:

i. It had to illuminate the organisational factors that influence the way roles develop;

ii. It had to provide an insight into the way the different parties, particularly the analysts themselves, perceived the change process;

iii. It had to provide a means of examining change over a period of time.

Two methods could have been used that would have satisfied some or all of these criteria: one was the survey, the other was the case study. The former is thought to be the most popular and widely used method of data collection in the social sciences (Bryman, 1989; Ghauri et al 1995). If the survey method had been used it would have involved devising a questionnaire, sending it to a number of organisations deemed suitable and requesting that the manager of the IS or Personnel Department distribute it to systems analysts within the organisation. The data would then have been analysed and statistical methods applied to identify relevant variables and any interrelationships between them. A rather different procedure would have been to conduct multiple interviews in several different organisations, taking care to ask exactly the same questions to ensure comparability of the data. The use of the structured interview would permit statistical analysis of the data and hence produce similar results to that of the self-administered questionnaire.

There would be a number of advantages in adopting this approach. Firstly, since little is known about what factors influence the way roles develop, it would have helped to identify those factors that may be important and the relationships between them. Bryman (1989), Ghauri et al (1995) and others suggest that the survey is useful for this type of exploratory work. A further advantage of the method is that it would be possible to gather a large amount of data relatively quickly and cheaply and to then subject that data to rigorous quantitative analysis. The latter would enable generalisations to be made across different organisations and would also be in keeping with the scientific tradition which emphasises the importance of measurement in the research process (Hirschheim, 1992: Easterby-Smith et al, 1991). A final advantage of the survey is that it would permit longitudinal analysis of the data. Thus, it would have been possible to admininster the survey at a particular point in time, collect data and then administer a second or even a third survey at intervals in the future. Such an approach would make it possible to develop measures of change that could, again, be subjected to quantitative analysis.

In spite of these advantages, it was felt that the disadvantages were greater. While it would be possible to gather data on a large number of analysts in a number of different settings, a survey would not permit the kind of detailed analysis that would illuminate the process of organisational change. Craig-Smith and Dainty (1991) maintain that the method fails to generate the "richness and depth of meaning" necessary to understand complex behavioural issues.

The last point suggests one of the key reasons the survey method was not used, i.e. it would not provide adequate insights into the analysts' subjective interpretation of the change process. The use of a survey would

not provide analysts with the scope to express their real thoughts and feelings nor would it possible for the researcher to probe issues that seem to be important but which the respondent may find difficulty expressing. The response rate to mailed questionnaires tends, in any case, to be very low, thus offsetting any benefits to be gained from the large numbers that could be targeted using this method (Nachmias and Nachmias, 1991). While interviews could have been used instead of/in conjuction with a self-administered questionnaire, this would have proven too time consuming, given the limited resources available to conduct the research.

The survey method was therefore discounted. The "alternative" to the survey method was to base the research on the case study approach. This would involve selecting one or more organisations and carrying out an in-depth study of the processes of organisational change and its impact on the chosen "population". In the event, it was decided that this offered the most viable approach to studying the phenomenon in question. The next section outlines the advantages of the case study approach and the reasons it was selected for this particular piece of research.

3.2 Advantages of the Case Study Method

The definition of a case study used here is that proposed by Yin (1984). He suggests that a case study is an empirical enquiry that:

- investigates a contemporary phenomenon within its real-life context when;
- the boundaries between the phenomenon and the context are not clearly evident and in which;
- multiple sources of evidence are used.

The chief advantage of the case study method is, as this definition suggests, that it is possible to examine phenomena in a "real-life" context. To develop any insight into the complex and dynamic way in which organisational and individual factors influence roles, it was necessary to examine, in detail, what is happening and what had happened, in an actual situation - in other words, to understand the context. The case study seemed to be the most effective method for undertaking this kind of detailed analysis.

A second main advantage of the case study method is that it would enable analysis to take place at different levels. As the research was concerned with interaction of organisational, individual and environmental factors, a method of investigation was needed which could straddle different levels of analysis, thus providing insights into the impact of contextual factors. The case study approach was considered to be superior to the survey because it would enable the researcher to examine the interrelationship of individual, organisational and environmental factors over time. The survey is much less suited to examining the processual aspects of reality (Bryman, 1989).

A third key advantage of the case study is also contained in Yin's definition, i.e. it permits the researcher to gather multiple sources of data. One of the problems with the survey is that it would provide essentially one means of collecting data. Using the case study approach, it would be possible to gather substantial background data on companies from secondary sources, conduct interviews with members of staff, observe staff in action, spend time observing organisational processes, etc. The virtue of using a variety of techniques is that it would permit a great deal of data

to be gathered and also facilitate cross-checking of information gleened, thereby increasing the validity and reliability of the data.

Another advantage of the case study is that it would provide a means of accessing the feelings of the analysts that could not be obtained using any other method. The case study lends itself to detailed interviews which enable the researcher to probe responses and follow up points that would not be possible using a self-administered questionnaire, particularly if the aim is to quantify the results. Although interviews may be used as the basis of the survey method, this would still divorce the subject from its context. Using the case study method, it would be possible to observe the interviewee in their "natural" setting and also to cross-check not only what one interviewee said with another, but to compare the responses gained from this technique of data gathering with other techniques. The effect, once again, would be to increase the reliability and validity of the data.

A final advantage of the method is that it would permit longitudinal analysis. It would be possible to use company data and archives as well as the memories of staff to build a picture of how the organisation and the roles of organisational members had changed over the six years covered by the research. This would, in turn, provide important insights into the process of organisational change and would be more useful than simply gathering data at different points in time, using the survey method. Given the limited resources available to conduct the research it would in any case be impracticable to administer a survey over a number of years. The technique of combining objective data from secondary sources and subjective data from individuals would, it was felt, create a picture of

organisational reality which could not be obtained easily using the conventional survey method.

3.3 Problems with the Case Study Method

The previous section identified some compelling reasons for using the case study. There are, however, disadvantages with the method. This section describes some of the key problems of using case studies and how these were overcome.

The first problem has to do with the debate about the value of qualitative research. As Yin points out, the case study method has frequently been attacked because it lacks the "rigour" of methods of data collection which use quantitative techniques of measurement, e.g. the survey (Yin, 1984). The essence of this debate lies in the contrasting philosophical positions inherent in the so-called positivist and interpretivist schools of thought. Positivism is based on the belief that the world exists as an external entity and that its properties should be measured objectively. The aim of scientific inquiry is to search for universal laws that will explain behaviour (Hirschheim, 1992; Glesne and Peshkin, 1992). Interpretivism, on the other hand, asserts that reality is socially constructed and that to understand the world it is necessary to discover how individuals interpret and construct social reality (Walsham, 1993).

In terms of the present research, the positivist position would suggest that the methodology adopted should be based on quantatitive techniques that would allow generalisations to be made and hence provide "proof" of the phenomena. The interpretivist position would suggest that qualitative techniques would be more appropriate because they would provide

insights into how individuals make sense of, and influence, the phenomena under investigation. Since one of the aims of the research was to elicit the systems analyst's *perceptions* of organisational change and its impact on their role, it follows that the use of qualitative techniques, in this instance the case study, would be the most suitable means of obtaining the data.

While the use of qualitative techniques is appropriate given the aims of the research, there are problems with it that cannot simply be discounted or ignored. A key problem is the generalisability of the findings. If the research is based on only one organisation, particularly if it focuses on just one group, it may be difficult to generalise from the findings. The aim in using the case study approach in the present study, however, was not to make generalisations but to develop insights and draw conclusions about the impact of change on roles in the organisations studied. Although the findings of the research may help to illuminate the impact of change in other contexts, it was not assumed that the research would be directly generalisable to other organisations. This use of the case study is consistent with the subjectivist, interpretivist approach of the thesis.

A third problem concerns the way in which the data is collected and interpreted. The large amounts of subjective information that case studies generate makes it difficult to classify the data and interpret the findings. There are techniques for overcoming these difficulties which were employed in this research. With regard to data collection, one way of reducing the problems is through careful research design. The latter is defined by Yin (1984) as "a logical sequence that connects the empirical data to a study's initial research questions and, ultimately, its conclusions". The research design should provide a framework within which the data

can be collected and interpreted. In terms of this research, the theoretical arguments outlined in Chapter One and Two indicated the type of information that would be needed and also suggested the categories within which it might be possible to organise the data.

A fourth problem with the case study method is the impact of the researcher on the situation being investigated. The very act of entering into an organisation and carrying out research changes the situation in some way and thus distorts the findings. Again, this is a valid criticism though any form of qualitative research suffers from the same problem. One way round it is to accept that the researcher's involvement will alter the phenomena and turn this to practical advantage. Action research, for example, is based on the assumption that the researcher and the research are part of the change process and it is the task of the researcher to influence the outcome. Instead of being "value-free", action research is, as Beynon puts it "value-saturated" (Beynon, 1988).

Although action research offers many advantages, it was not considered an appropriate method of investigation for the present study. There were a number of reasons for this. Firstly, it is often used where the issues to be tested in practice are well understood (Edwards and Talbert, 1994). This was not the case with the present research - many of the issues that were deemed to be important were being addressed for the first time. Secondly, although all the organisations that took part in the research were experiencing a period of rapid change and some had implemented change programmes, direct intervention in this would not have been welcomed by some of the stakeholders as the situation was considered to be very sensitive. A third reason was more pragmatic. Action research is often a

long drawn out process which requires a commitment of resources that were not available to conduct the present study.

The decision not to use an action research approach still left the problem that the researcher's involvement would alter the nature of social reality. There is no foolproof way of overcoming this particular difficulty other than for the researcher to make explicit any prejudices or prior assumptions and to be as neutral as possible. Certainly, in carrying out the research every effort was made to guard against "putting words" in the interviewee's mouth or leading him/her towards a particular conclusion. The next section, which examines the way in which the research was carried out, considers these issues in greater detail.

One final point concerns whether, in view of some of the disadvantages of the case study, a solution would have been to combine the survey and case study methods. Gable (1994) describes a study in which the research procedure involved a single pilot case study, multiple case studies of five firms, model specification and survey. While the use of these diverse methods would provide an extremely rich source of data, it is only practicable where there are substantial resources available to conduct the research and the companies are willing to grant access. Unfortunately the resources to carry out this investigation were extremely limited and the research was plagued by problems of gaining access.

3.4 Data Collection and Analysis

3.4.1 Selecting the Cases

Once the decision had been taken to use the case study approach, it was necessary to determine how many organisations to include. Since the research had adopted an interpretive/contextualist philosophy, it could be argued that the number should be restricted to just one or two as this would permit a much more detailed analysis of the factors influencing roles. Critics of contextualism argue, however, that where just one or two organisations are used, the results tend to be highly organisation specific thus making it difficult to generalise from the findings (Dawson, 1994). The use of several case studies is often advocated as a solution to this problem (Yin, 1984). Although there are advantages in being able to make generalisations from the findings, as suggested earlier, it was not assumed that the results of the research would be directly generalisable to other organisations. The use of multiple case studies could not, therefore, be justified on grounds of generalisability. The main reason it was eventually decided to use a number of case studies was that (a) by varying the context it would be possible to highlight the influence of contextual factors in each cases and (b) it would be possible to examine differences between organisations and draw contrasts, thereby creating a richer and more diverse picture of the impact of organisational change on roles.

Having decided to use more than one case study, the question arose of exactly how many would be appropriate. Six was considered to be a large enough number to examine differences but was not so large that it would be difficult to acquire any depth of insight into the way the organisations operated. The co-operation of six organisations was initially secured but

one dropped out at the last minute, leaving a total number of five. It was not possible, given the limited time constraints of the research, to find a replacement. In the event, this did not prove to be a disadvantage. Five organisations was an easier number to manage and it was still possible to gather a great deal of valuable information on the analysts and the impact of change on their role.

The next consideration was what type of organisations should be included in the research. It seemed advisable to focus on large, well established organisations operating in a sector where IT is crucial to organisational survival. In this type of organisation, the impact of change on specialisation would be more apparent than in smaller firms where limited resources tend to restrict opportunities for specialisation and roles are more fluid. It was important to select organisations where IT was critical to organisational functioning because this would impose greater strains on traditional divisions of labour and the effects of change on roles would, again, be more visible. The organisations also needed to have experienced rapid or dramatic change during the last few years. As suggested in the Introduction, this was important because the effects of change on roles would be more apparent and because the BCS maintains that hybrids are most likely to emerge during periods of rapid change or when the organisation experiences a crisis (BCS, 1990).

Other criteria used to select organisations were the size of the IS population and the size and structure of the IS department/division. The larger the number of IS professionals employed, the more likely it would be that roles would be specialised (NCC, 1989). If they were broad based, this would be a reflection of factors other than just the size of the organisation. The size and structure of the IS Department/Division was

another criterion. The latter needed to be fairly similar so that their effects could be controlled. Clearly, if one organisation had physically redeployed analysts to the business areas and another had located them close together on the same site, the differences which emerged could be attributed to structure. If, however, all the analysts were located in the same structure and differences between their roles emerged, this would be a result of other factors that it would be the task of the researcher to identify.

Large financial service organisations and retailers met all the above criteria. Although the research could have been based in organisations in other sectors - manufacturing and transport, for example, would also meet most of the criteria - there were particular advantages in selecting large finance organisations and retailers. Firstly, some work had already been carried out on skills development in IS in financial institutions - City University had previously examined changing skill requirements in financial services sector - so the investigation would be building on research that had already been undertaken (City University, 1991). Secondly, the similarities between financial service and retail organisations meant that they were sufficiently close to be comparable in terms of the main parameters of the study. In terms of structure, for example, all the organisations that were selected for the research operated out of a large headquarters based in the UK and used an extensive branch network in this country and overseas to dispense services or products. IT is also used in both sectors to support a large volume of routine transactions and to provide support to strategic decision-making. The environment in which the analysts worked would therefore be very similar. There were sufficient differences between the organisations, however, to illuminate the impact of sectoral effects. The decision to base the research in two sectors rather than one was partly to allow for a greater

number of variables to be studied and partly to examine the impact of sectoral factors.

3.4.2 Contacting the Companies

Once the decision had been taken to focus on financial service and retail organisations, the next step was to contact companies to seek their co-operation in the research. A letter was sent to the IS or personnel managers of six organisations explaining the purpose of the research and requesting an interview (See Appendix A1 for a copy of the letter). Interviews were subsequently arranged with the personnel managers of three large financial service companies and two large retailers. As suggested earlier one organisation, a retailer, withdrew at the last minute which meant that five companies in all took part in the research. Although this was fewer than anticipated, the companies that participated were large and well-known. The findings of the research would therefore provide significant insights into how companies that are prominent members of the business community manage IS-related roles.

Everyone who agreed to be interviewed was sent an Executive Summary of the research which set out the main aims and objectives, the proposed methodology and potential benefits of the research to the organisation. A copy of the Executive Summary can be found in Appendix B1. The interviews that took place lasted in each case approximately one and a half hours and had two aims (a) to persuade the manager to co-operate in the research and (b) to obtain important background details on the organisation. The interview format was semi-structured. The virtue of this approach was that it would enable comparable data on key areas to be gathered in different organisations but it would be possible to probe

particular issues and allow the interviewee to raise any issues which they thought were important in their organisation or which had not previously been considered (Ghauri et al, 1995). A copy of the interview schedule used can be found in Appendix C1.

3.4.3 Selecting the Sample

During the interviews with managers, it was agreed that they would select the sample. The latter was to be composed of people who carried out what the organisation deemed to be the systems analyst's role. The main reason for asking managers to select the sample was to find out how the organisations were defining the systems analyst's role. Mayn (1976) points out that allowing management to select the sample raises questions of bias, i.e. they may have selected only those staff who were likely to give a good account of the organisation. It was established at the outset, however, that the objective was to "get at the truth" and that it would be in management's interests to select people from different backgrounds, with different views and aspirations. To reduce the scope for bias, two managers - one from IS and one from Personnel selected the sample jointly. Each organisation nominated seven systems analysts to take part in the research. This number was agreed because it was what the managers interviewed felt they could accommodate and partly because of limited time constraints to complete the research.

In all, three groups were interviewed as part of the research - IS managers, personnel managers and systems analysts. These were considered to be the principle stakeholders. A decision was taken not to include in the sample users from the business areas. The main reason was simply that the views of the analysts themselves were deemed to be most important and should

form the focus of the study. There would, in any case have been practical problems in eliciting the views of users. It would be difficult to locate users in all the organisations who worked in roughly the same areas and had been with the organisation sufficiently long to have a perspective on the change process. While this could have been overcome by distributing an internal survey to key personnel in the business areas, the latter was considered to be too disruptive and time consuming given the limited resources available. Data on user perceptions was obtained from the personnel officers who took part in the research. They worked closely with IS staff and therefore understood their problems but were also users themselves and hence able to adopt a critical position. Senior managers were also not included in the research. Although it would have been desirable to obtain their impressions, gaining access to senior levels proved to be difficult in some of the organisations.

3.4.4 Collecting the Data

A number of techniques were used to collect the data. In the first instance, a self-administered questionnaire on the respondent's career development was devised. Managers in each of the companies were asked to distribute this to the member of staff selected. A copy can be found in Appendix C2. This sought data on the respondents' job description, position and location in the organisation; their sex; educational background; the jobs they had held prior to working for their present employer; the roles they had held with their current employer; the training they had received; their career aspirations and any factors which they believed would prevent them from achieving their career aspirations.

The above information was gathered to provide a basis for interviews with each of the respondents and also to enable some quantitative analysis of the findings. While as stated previously, the research was based on qualitative methods, it was still felt useful to generate some numerical data. The small size of the sample meant, of course, that none of the data collected could be used to draw statistical inferences. This was not, in any case, the intention. The quantitative analysis which was applied was to assist in identifying similarities, patterns and correlations - not to generalise to statistical populations.

The normal procedure when devising a questionnaire is to pilot it to ensure that the questions are fully understood and that the information obtained is likely to be useful (Oppenheim, 1966). In terms of the present research there were two ways in which this could have been done. The first was to pilot the questionnaire in one of the organisations and then refine it on the basis of the results. Another was to locate a representative sample of systems analysts outside the organisation and ask them to complete it. In the event, the latter was chosen. The author of this document teaches students on part-time computing courses, many of whom are systems analysts. It was possible, therefore, to refine the basic questionnaire by asking them to complete it and highlight any questions they did not understand or felt were irrelevant to their experience.

When the questionnaires had been completed by respondents in each of the companies and returned, follow-up interviews were arranged. Interviews were felt to be the most appropriate means of gathering the bulk of the data because, as Burgess (1982) points out, it enables the researcher to "probe deeply to uncover new clues, open up new dimensions of a problem and to secure vivid, accurate inclusive accounts

that are based on personal experience". The interviews were semi-structured to obtain these advantages but also to ensure that the same sort of information was being sought in each organisation (Mason, 1996). A copy of the interview schedule used to guide the questioning can be found in Appendix C3. All the interviews lasted ninety minutes and were tape recorded. The tapes were then transcribed and formed the basis of field notes.

The aim of the interviews with analysts was threefold. Firstly, it was important to obtain a description of their role and how it had changed over the last six years. While the analysts had been asked to supply details of their role in the Career Development Questionnaire this was necessarily brief: the interview offered an opportunity to elaborate on what had been written and clarify any areas of uncertainty. The second aim was to obtain their impression of how the IS department/division and the organisation had changed over the period under investigation and to what extent this had influenced their role. A third aim of the interview was to gauge the analysts' orientation to their work role. It was important to ascertain whether they were interested mainly in the technical aspects of their work or in managing people and processes, interacting with the business areas, etc. This could have been ascertained by administering a Career Orientation Questionnaire, similar to that devised by Schein (Schein, 1978). This was felt to be too time consuming for the interviewees to complete so questions were asked that would provide an insight into what the analysts found interesting or satisfying in their jobs, how they saw their career developing, etc.

In devising the Questionnaire and carrying out the interviews, care was taken to ensure the validity and reliability of the data. Information

supplied in the Questionnaire was cross-checked in interviews to ensure that the information given was correct. In the interviews internal consistency was established by asking the same questions at different points in a slightly different way and by asking a series of questions on a related theme. While this did not eliminate the problem of bias - it is, for example, common for people to hold inconsistent views on a particular subject - it did make the research more rigorous (Oppenheim, 1966). Information from one source was also cross-checked with another, thus enabling a range of different perceptions to be gathered on any one issue. Again, this did not eliminate the problem of bias but it highlighted inconsistencies and focused attention on areas where more data was required.

The data collection procedure relied on three techniques - company literature, a questionnaire and interviews. There were other techniques that could have been employed. Since little is known about what system analysts actually do, one strategy would have been to ask the sample to keep a diary of their activities similar to the diaries kept by managers in Stewart's early research on managerial behaviour (Stewart, 1967). Their entries would have been "content analysed" in terms of predetermined categories indicating, for example, instances of contact with users, amount of time spent at the computer, etc. While the diary is a useful research technique, it was not employed in the present study because (a) the categories used by the analysts to record data would have to be fairly simple, hence complex categories of information would not have been accessible and (b) it would have been difficult to persuade the analysts to keep a diary given their heavy work commitments.

When the interviews in each organisation had been completed, a report of the findings was sent to the interviewees to check that their views had been fairly and accurately represented and that all the data contained in the report was accurate. It was important that this should be seen by the interviewees before it went to management as an undertaking had been given to protect the identity of those who took part in the research and to guarantee the confidentiality of the findings. The interviewees were asked to complete a form or telephone to confirm that they were satisfied with the contents of the report, to correct any errors or to identify any misconceptions. A copy of the Confirmation Note sent to interviewees can be found in Appendix D1. When the interviewees had certified that the findings were accurate, the report was then sent, in confidence, to management for their comments. The aim of this rather exhaustive procedure was to check the accuracy of the findings, thereby increasing the rigour of the research.

3.4.5 Data Analysis

Once all the interviews had been completed and the field notes had been written up, the task of analysing the data began. The categories used for data analysis had already been established prior to the research but were refined as the research progressed. Data was required on the organisation, the individuals who took part in the research and on the sector. In describing the organisations, it was necessary to seek information on the history of each organisation; its market position; numbers employed; IS, business and human resource strategies; organisational structure; and culture and changes in management etc. For many of these items, it was necessary to obtain comparative data extending back over five to ten years. To facilitate analysis, all the data that was gathered was organised under

appropriate section headings for each of the organisations and these were were then used as the basis for comparisons across companies.

Data categories for individuals covered objective data that could be quantified - job title; age; sex; education; qualifications; employment experience; membership of professional and other bodies; tenure; job moves in the organisation; training provided by the organisation; skill requirements and also subjective data - perception of role; orientation to role; main sources of satisfaction with job; career aspirations; perception of organisation; perception of IS division/department; perception of the career system; sources of change in role; perception of the effects of change on role; factors constraining change; perception of future developments in the IS department/division. Background information on individuals was assembled from the data provided in the Career Development Questionnaire and supplementary material provided in interviews.

The data on roles and career development was gleened from the Career Development Questionnaire and interviews. Some of the data was easy to interpret because the questions were designed to elicit specific, factual information, e.g. whether the respondent had carried out any programming in their first position within the organisation. Other questions were kept deliberately broad to allow maximum freedom in responding. Interviewees were asked, for example, to state whether their role had changed and, if so, to describe those changes. This open-ended approach generated a great deal of valuable qualitative information and also provided the opportunity to probe issues that may have been sensitive and interviewees would be reticent about discussing directly, e.g. trade union membership, strategies for getting on in the organisation, etc. The disadvantage was that it made data analysis more problematic. In the

event, data categories were refined to take account of the new data that were generated.

The categories for analysing the data on organisational factors influencing roles had already been suggested by the theoretical arguments developed at the beginning of the research. Data was gathered and analysed under headings relating to management policies, strategy and structure; culture; labour supply; approaches to systems development; occupational structure; the career system and group factors. The information on these issues was derived from careful reading of company literature and interviews with managers and analysts. Information on the sectors in which the organisations operated was obtained from secondary source material. Information on the key external forces that were believed to be driving change was derived largely from company literature and in interviews with IS/personnel managers where they were asked about the problems facing the business.

3.5 Problems and Constraints

Problems were encountered at all stages of the research process. This section considers these problems in more detail and explains and the steps taken to overcome them. The first set of problems related to identifying and defining the phenomena to be investigated. At the outset it was not clear that the main issue was the impact of organisational change on roles. The initial focus of the research was the career development of hybrid managers. This changed when it became apparent that the hybrid manager concept was a "red herring", that is, it distracted attention from the real issue which was the growing need for all IS professionals to possess some hybrid competences. The difficulties many organisations

appeared to be experiencing developing staff with these competences eventually led to a consideration of roles and the organisational constraints on developing hybrid IS professionals. While the focus of the research had changed, this was less of a problem than it might have been because the issues that were explored in the early stages of the research were highly relevant to the topic and could thus be used as part of the findings.

Once the focus of the research had been established, there were still problems involved in defining the concepts used in terms that would facilitate actual data gathering. There were problems involved in defining the term "systems analyst", for example. Although it would have been possible to base the research on the BCS's definition, this was felt to be too restricting. Eventually, it was decided to define the systems analyst as someone who investigated business problems and used their knowledge of the approaches to systems development to produce computer-based solutions. This definition seemed to capture the key elements of the role, particularly the need to possess specialised knowledge of approaches to systems development.

Further problems were encountered in defining the content of roles with precision. The terms "business oriented" and "technically oriented" were frequently used to distinguish those activities which involved examining business problems that required an IT solution, dealing with users in the business areas, etc. and those which involved work at the computer, designing and developing systems. Analysts are engaged in an enormous range of activities which may involve some technical aspects and some business aspects. The problem was deciding where the balance lay. The use of the diary technique, described earlier, would have helped sort the

analysts' activities into categories determining the precise balance of competences. Since this was not possible, the analysts' interview statements were examined closely to distinguish activities that mainly involved working at the computer; managing people or processes and dealing directly with business matters. The results were then interpreted to provide an indication of the balance of technical, managerial and business competences.

The next stage of the research process - data collection - also presented problems. Before the work in organisations began a great deal of information was collected from secondary sources. This had to be sifted and organised in ways that would be useful in interpreting the results of the research.

Once all the secondary data had been gathered, the main problem was to persuade organisations to take part in the research. Although all those contacted felt the issue was topical and relevant to their immediate interests, it was also regarded as highly contentious. Management were clearly worried that the research would unsettle staff and that there was a risk of confidentiality being breached. Both financial service and retail companies were anxious about issues of confidentiality. Two of the organisations believed that their career system was a source of competitive advantage and were concerned about their rivals adopting similar "successful" practices should details of it become known. These fears were allayed by assuring the managers concerned that (a) they had a right to see everything that was written about them; (b) in conducting the research individuals' names would not be mentioned and (c) they would be sent copies of all material that would be sent for publication. These assurances

satisfied the managers concerned and helped to establish the integrity of the research.

Apart from the difficulty of persuading the organisations to take part in the research, a key problem was resources, particularly the time available to conduct interviews in several organisations. This was the principle reason for restricting the sample size in each organisation to seven. While it would have been desirable to interview more analysts, the advantage of interviewing a relatively small number was that it was possible to gain a depth of understanding and insight into the role that would not have been possible if the sample size had been larger.

Another problem associated with data collection was obtaining factual data from company records. Although the research relied on qualitative techniques and the perceptions of the relevant parties were the main focus of attention, it would have been useful to obtain some statistical data to enable comparisons to be drawn across companies using objective measures. Data covering a period of six years was sought on changes in IT spend; turnover rates in IT; the relative distribution of IS professionals between different occupational groups and internal mobility rates. This data would have provided an indication of the extent of change in IS over the last six years and helped to place the interviewees' perceptions in context. There were a variety of reasons it was difficult to obtain this data. One was that all the companies considered it to be highly confidential and were reluctant to divulge anything which could be potentially damaging. Changes in the size of the IS population and turnover rates were considered particularly sensitive because of the high levels of insecurity generated by job losses within the organisations generally.

Some information was difficult to obtain because it was not kept or held in a form that could be used in the research. None of the companies, for example, tracked internal mobility rates in their IS department/division or had assessed, over time, how many staff had moved from one occupational group to another. Even if they had, it would have been extremely difficult to make meaningful comparisons across organisations because of the differences in the way data are classified and maintained. These problems meant that it was only possible to obtain data from company reports and general handbooks. Careful analysis of these documents did yield some useful information on general changes in the numbers employed in the organisation, the amount spent on IT, etc. which were used in the research.

A further difficulty was obtaining sufficient information on particular aspects of the problem that may be extremely important but were either not available or clearly documented. A good example of this is the organisation's corporate and IS strategies. In the models presented in Chapter One, it was suggested that both would have an impact on roles. To determine whether this was the case, it would have been useful to obtain documents containing details of the company's corporate and IS strategies. In the event, these were not available. The relative importance of corporate and IS strategies had to be inferred from discussions with the managers who took part in the investigation, company reports and articles which had been written about the organisation either by a member of it (usually the chief executive) or a consultant. Using these sources it was possible to build a picture of the way corporate and IS strategies had changed and how they may have influenced roles but this would have been much improved had company documents been available.

Perhaps the biggest problem encountered in the research was ensuring the validity of the research design. The main difficulty was to do with construct validity, i.e. establishing correct operational measures for the concepts being studied. Yin (1984) suggests that this problem can be overcome by using multiple sources of evidence, establishing a "chain" of evidence and asking key informants to review case study notes. Every effort was made to adhere to these procedures in the present research. In terms of multiple sources of evidence, data was gathered using different techniques and different sources. The term "chain of evidence" refers to establishing a means whereby it is possible to detect the logical links between the research questions, the methods used to collect the data, the findings and the conclusions drawn. In writing up the thesis, efforts were made to establish these logical links in the reader's mind through careful cross-referencing of conclusions, findings, methodology and theory. The third suggestion Yin makes is to ask key informants to read the case study notes. As suggested previously, the systems analysts who took part in the investigation and their managers were asked to review reports of the findings to ensure that they were accurate, honest and unbiased. Using these different "tactics" it was possible to increase the degree of construct validity.

A final problem was the difficulty of studying change over time. The use of the survey, administered at regular intervals would have provided useful measures of change but, as suggested previously, it was not possible to use this method because of the time constraints involved in carrying out the research. The approach adopted - relying on the memories of staff and the limited archival material available is open to the criticism that it lacks objectivity and that it is difficult to prove cause and effect. These are valid points but the research was not designed to test cause and effect. The

aim was to identify potentially important variables and explore their impact on roles. Subsequent research is needed to test cause and effect of particular variables.

3.6 Summary

The Chapter has described and justified the method selected to investigate the research problem. After careful consideration of the alternatives, the case study was chosen because it satisfied all the criteria established to investigate the research problem, e.g. it would provide insights into the dynamics of the change process in a real-life setting; provide a means of accessing the the feelings of the sample population, etc. While there were clear advantages in using the case study method, there were also a number of disadvantages. These fell into two main categories: the first related to the problems of qualitative research - the difficulty of establishing objective measures, problems of bias, etc; the second related to the practical problems of data collection and analysis - the difficulties of recording and classifying large amounts of data. With regard to the former, it was argued that the nature of the investigation called for a subjective, naturalistic, interpretative approach and that the case study method suited the subject-matter of the thesis. The second set of problems could be overcome by careful research design.

The procedures used to collect and analyse the data were described in the Chapter. Background information on each of the companies and the sector in which they operated was obtained from secondary sources. Interviews were conducted with a personnel manager and an IS manager in each of the five organisations that took part in the research to gain their permission to undertake the research and to collect background data. The

managers selected the sample. The latter was composed of seven people who carried out what the organisation deemed to be the systems analyst's role. Each member of the sample completed a self-administered questionnaire on their career development and were interviewed to obtain further information on their role, career development and the impact of organisational change. The results were written up in the form of field notes or a report and sent to all those who took part in the research to check the accuracy of the findings. Once the data had been gathered, it was analysed in terms of the key questions of the research.

Problems were encountered at every stage of the research design. These included the difficulties of establishing the focus of the research, operationalising key concepts, gaining the co-operation of the organisations and non-availability of company documents. In spite of these difficulties, the findings indicate that the method selected - the case study - did provide a suitable means of gathering a wealth of fascinating qualitative data.

CHAPTER FOUR

Overview of the Case Study Organisations

4.0 Outline of the Chapter

This Chapter provides an overview of the three financial service and two retail companies that took part in the research. The first part of the Chapter places the discussion in context by describing the key changes in the macro-environment that have influenced the organisations and identifies some of the factors that may constrain change. It will be shown that there have been five key forces for change in the macro-environment that have influenced the case study organisations: increased domestic and international competition; changes in the legal environment; the emergence of new social attitudes and values; demographic changes and advances in technology. These factors have exerted enormous pressures on the organisations and resulted in significant changes in strategy, structure and culture over the last ten or fifteen years. It will also be shown that each of the organisations has responded differently to these external pressures and that there have been forces resisting change as well as forces driving change.

4.1 Macro-Environmental Change

4.1.1 The Financial Services Sector

The term "Financial Services Sector" (FSS) is used here to refer to those institutions whose primary function is to provide financial services and products to individuals, organisations or other bodies. Commercial banks, insurance agents, building societies, stockbroking firms and credit companies may all be classified as belonging to the FSS [1]. The importance

of the sector to the British economy can be gauged from figures which indicate that in early 1996 it accounted for 19.2 per cent of Gross Domestic Product (Country Report, UK 1996).

The last ten or fifteen years have witnessed enormous changes in the way financial service companies operate. The most important of these are the growth of competition; the abandonment of restrictive practices; the erosion of traditional boundaries between different organisations; the introduction of a wider range of products and services and growing use of technology to support product and service delivery (Ennew et al, 1990; Crook, 1992; Unger, 1992; Keyote, 1993; Keynote, 1996). These developments are the result of a number of "forces for change" in the macro environment, including: fluctuations in the domestic and international economy; deregulation and re-regulation and advances in technology (Gardner and Molyneaux, 1990; Crook, 1992; Drew, 1994;)

The most significant change in the FSS in recent years has undoubtedly been increased domestic and international competition (Maycock, 1986, Higgs, 1988). This is largely a result of changes in the domestic and international economy in the postwar years. In terms of the domestic economy, the effects of prolonged recession during the 1970's followed by the economic boom of the 1980's was important in stimulating greater competition between financial service companies. The key driving force, however, was changes in the international economy. The growth of the Japanese economy, and the economies of many hitherto "Third World" countries, the integration of Europe and globalisation of business all conspired to break down barriers between different business areas within the financial services sector and greatly increased the degree of domestic and international competition.

The spur to change was the decision by a number of overseas competitors in the mid 1970's to abandon many of the restrictive practices that had inhibited competition. In the US, the passage of the 1975 Securities Amendment Act, for example, gave the national securities market greater access to nonsecurities firms and ended price fixing on securities brokerage (The Economist, 1991). This, and other measures, enabled American financial institutions to operate more effectively in global markets than their British counterparts.

The threat of increased competition persuaded successive British governments in the 1970's and 80's to dismantle the regulatory mechanisms that inhibited domestic and international competition. The most significant measure was, perhaps, to alter the Stock Exchange rules to admit corporate and overseas membership of the Stock Exchange. This swelled the number of foreign investors in London. To survive in what was now a highly competitive market, British institutions were forced to overhaul traditional methods of doing business (Plender and Wallace, 1986). The key change was the switch from trading on the floor of the Stock Exchange to electronic trading. "Big Bang" - the introduction of electronic trading - in October 1986 coupled with the abolition of long-standing restrictive practices and anti-competitive policies ushered in a period of very rapid change in the FSS (The Economist, 1991).

The effect of these changes was to eradicate the traditional divisions between financial institutions. The clearing banks bought securities trading firms and merchant banks and also acquired trusts. Changes in the law enabled building societies to diversify into many of the areas traditionally the preserve of retail banks, e.g. consumer lending, insurance underwriting, portfolio management, etc. (Scarbrough, 1992). Non-

financial companies, particularly retail organisations, began to enter the financial market. This, and the deregulation of the securities industry, hitherto the most highly regulated part of the FSS, greatly increased competition and accelerated the growth of the financial conglomerates which increasingly dominate the FSS in Europe and the US (Maycock, 1986; The Economist, 1996).

While the 1980's witnessed the abandonment of many restrictive practices, there has since been a move towards re-regulation and supervision. This was partly a result of fears that the traditional methods of self-regulation were insufficient to cope with the increased number of participants in the London Markets and partly concern about lack of protection for investors following the collapse of a number of well-known financial institutions (Veljanovski, 1988). The imposition of new regulations has meant that companies have had to monitor their activities more closely. This has imposed a heavy administrative burden on companies and, according to some commentators, greatly increased costs (Goodhart, 1988; Veljanovski, 1988). Both deregulation and re-regulation have therefore had a significant impact on the way financial companies operate over the last decade.

Another important force for change in financial services during the 1980's and early 1990's was changes in the pattern of demand. This was a function of the emergence of new demographic patterns and changing social attitudes. In terms of demography, the fall in the birthrate in the 1960's, the trend towards smaller families and improvements in living standards meant that the population was becoming older and more affluent (Keynote, 1995). Consequently, there was a strong increase in demand for certain types of products - mortgages, pensions, life assurance, etc. This,

coupled with the growth of competition, put pressure on financial institutions to introduce a wider range of products and services and to respond flexibly to changes in the market. Greater flexibility was also required to cope with the effects on consumer behaviour of changing social attitudes. The 1970's and 80's saw the growth of public concern about environmental, civil and animal rights issues (Vallely, 1991). This tended to make companies more conscious of their public image and resulted in some dramatic changes in policy. The Co-Operative Bank's decision not to invest in organisations that violate animal rights is indicative of the impact of changing social attitudes in the FSS.

The final force for change, and the one which enabled organisations to respond to the other changes outlined above, was advances in technology. In the last ten years financial service companies have become the biggest business user of IT. In the banks, for example, IT accounts for over 20 per cent of expenditure and is their second largest business cost (Proctor, 1992). It was advances in technology that made possible the switch to electronic trading, i.e. the Big Bang referred to earlier. More generally, advances in IT have enabled companies to restructure their business, reduce staff numbers, cut administrative costs, provide better access to information and improve customer service. The development of telephone banking in the mid 1980's provides a good illustration of these points. Telephone banking (and its associated technology) has created the opportunity for banks to reduce the numbers of branches they maintain, to employ fewer clerical staff, reduce the costs of paper transactions and improve customer service by providing round the clock, remote access to a wide range of financial services (Legg, 1994). It is therefore enabling companies to change the way they do business and giving them a potential source of competitive advantage.

The introduction of telephone banking calls for IS professionals with skills in networking and telecommunications technologies. Demand for staff with skills in these areas is likely to increase as is demand for staff with a range business and managerial skills, i.e. hybrids (City University, 1991). The latter reflects the general trend towards decentralising IT and giving responsibility for IT resources to the business areas (City University, 1991). It is also a reflection of advances in technology which have made it easier for users to carry out many routine technical tasks themselves (City University, 1991). Current trends, therefore, would suggest that financial institutions in future will continue to require staff with specialist skills but there will probably be a greater need for IS professionals with generalist abilities.

4.1.2 The Retail Sector

The term "retail sector"(RS) can be used to cover any organisation that sells goods or services to consumers [2]. This definition is sufficiently broad to cover not only shops on the high street but also many of the financial institutions described in the previous section. While the core businesses of retail and financial companies are different, this distinction has become increasingly blurred over the last ten years. All the major banks, for example, possess a retailing division and have introduced "one stop financial shops" selling a wide variety of financial services. Similarly many department stores now sell a range of financial products and services. Like the financial services sector, the retail sector makes a major contribution to the economy. Figures for 1995 indicate that the sector contributed 23 per cent to the Gross Domestic Product [3].

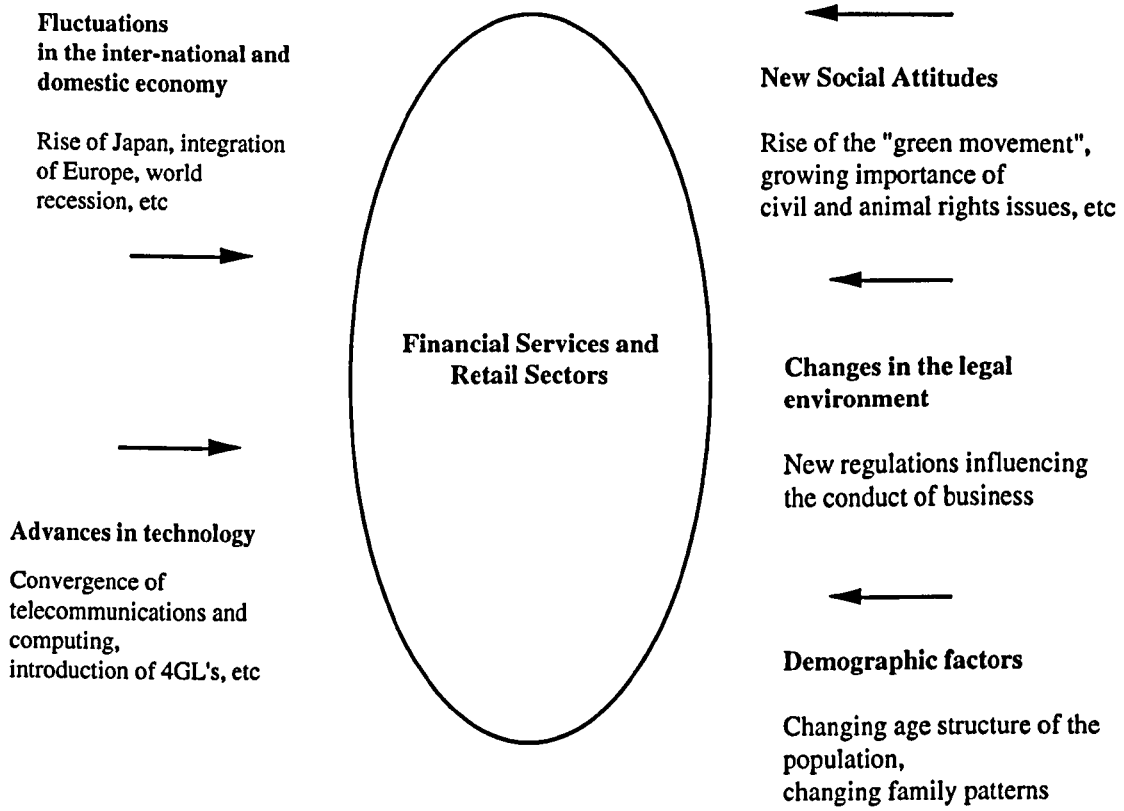
While there are similarities between financial services and retailing, there are also important differences. The most obvious is that financial service companies deal only in financial products and services, wheareas organisations usually thought of as belonging to the retail sector sell a much wider range of items. Secondly, retail organisations will often sell items that have been produced by another source. Unlike finance companies, therefore, they are part of a complex distribution chain which exists to move goods between producers and consumers (Ford, 1991).

Retailing has always been a fast moving business. The pace of change has accelerated, however, in the last ten to fifteen years. The main changes are similar to those in the FSS, i.e. the growth of competition; the internationalisation of business; changes in the pattern of demand and the growing use of technology to support and enhance product and service delivery. The macro-economic forces driving change in both the retail and financial services sectors are depicted in Figure 5.

The similarities between the sectors are partly a result of the blurring of the boundaries between them and partly a reflection of their similar operating structure, i.e. most medium/large-sized retailers and FSS companies deal with large numbers of transactions on a daily basis and maintain a branch network. Both sectors have also been subject to similar forces for change in the external environment, i.e. fluctuations in the domestic and international economy, changes in the profile of customers, changing social attitudes, changes in the law and advances in technology. The impact of these external forces on retailers is discussed in more detail in the next few pages.

Figure 5

FORCES FOR CHANGE IN THE FINANCIAL SERVICES AND RETAIL SECTORS



Fluctuations in the domestic and international economy have exerted a strong impact on the profitability and market positions of companies and been a major factor in stimulating competition. The latter is clearly reflected in the rise of large scale operators in the RS during the 1980's and early 1990's. Sales of large operators with multiple outlets increased by 133% during the 1980's compared with 75% for single outlet retailers. The favourable economic conditions of the 1980's provided the capital which enabled these organisations to expand (Eurostat, 1993). This growth tended to be at the expense of smaller companies, many of whom were "squeezed" out of the market (Eurostat, 1993). The downturn in the economy in the early 1990's also increased competition but for different

reasons [4]. Customers had less purchasing power and it became harder to attract them [5]. To retain their market share, many retailers began to cut prices, a strategy which had been avoided in the 1980's because it produces few long-term benefits (Economist Intelligence Unit, 1994). This in turn forced companies to introduce measures to cut costs, particularly through restructuring and redundancies.

The decision to compete by cutting prices was also spurred by the arrival of continental stores selling items at substantially reduced prices (Euromonitor, 1993; Wrigley, 1994; Burt, 1995). Like financial service companies, retailers began to experience greater competition from abroad during the 1980's and early 1990's as a result of the changes in the international economy, described earlier, e.g. the opening of new markets in Europe, the old Soviet Block and and Central and Eastern Asia (Eurostat, 1993). While these changes offered British retailers a unique opportunity to expand into fast growing markets, and to form strategic alliances, as in the FSS, they also provided foreign competitors with the opportunity to exploit the British market (Davies, 1991; The Grocer, 1995; Burt, 1995). Research suggests that the UK became the top destination for European and US Cross border expansion during the 1980's (Humphries and Samways, 1993). This clearly placed enormous pressure on established retailers to compete more effectively.

Another important change in the RS was changes in the pattern of demand. This was partly a reflection of the emergence of new demographic trends and partly a reflection of the "revolution" in social attitudes described in the previous section. The trend towards smaller families, the growing affluence of the population, etc. meant that consumers could afford to buy a wider range of better quality goods

(Humphres and Samways, 1993). Consumers were also more aware of environmental and social issues and more discerning about the type of goods they would buy (Ford, 1991). Consumption of meat and fatty products, for example, declined sharply in the 1980's and early 1990's as a result of the success of various health and animal rights campaigns. In the RS as in the FSS, these changes forced companies to be more sensitive to public concerns and more innovative in their approach to product development and marketing.

One social change which deserves particular mention because it affected large segments of the RS was the general migration of the population from the inner city areas to the suburbs (Keynote, 1995). Many of the larger companies responded to this change by eschewing city centre sites and building new stores out of town, closer to where people actually lived. In adopting this strategy, they were greatly aided by changes in local authority regulations which made planning permission easier to obtain. The economic downturn of the early 1990's, however, coupled with the increased difficulties of obtaining planning permission, slowed the rate of expansion [6]. This increased pressure on stores and forced some to seek new markets abroad or to re-establish stores in city centres [7]. Tesco's decision to open a number of "metro" stores in city centres is evidence of a strategic shift in direction (Schurer, 1995).

The final force for change in the RS over the last ten to fifteen years has been advances in technology. Like the FSS, the RS is a major user of IT. Many of the large retailers, however, began investing in IT much later than the financial service organisations and have therefore had a certain amount of "catching up" to do. This has placed them at something of an

advantage. They are less encumbered by old systems and better able, therefore, to reap advantage of advances in technology.

It was the introduction of scanning techniques and electronic funds transfer at point of sale (EFTPoS) in the 1980's which persuaded many retailers of the benefits of new technology. The information scanning generates can be used to re-order stock to ensure that supply of items reflects actual demand. EFTPoS enables customers to pay by debiting their account at the bank, thus improving customer service and reducing the costs of paper transactions (Humphries and Samways, 1993; Keynote, 1995).

The internationalisation of retailing, discussed earlier, is another development that increased pressure to invest in new technology, particularly telecommunications. Where British retailers opened stores abroad, they needed a sophisticated telecommunications network to control the operation effectively. Marks and Spencers, Sainsbury's and Boots all rely on sophisticated networks to provide links between their overseas operations and headquarters in Britain [8]. Telecommunications technology is also crucial to the development of home shopping. Tesco has already set up a pilot scheme to assess the viability of home shopping and others are likely to follow suit. If home shopping "takes off", telecommunications will be the main means of facilitating transactions, just as it is in home banking .

The advent of home shopping will alter the structure and operation of large segments of the retailing sector (Bubb, 1991). The skills profile of staff is also likely to change significantly since the main value added will shift from the retail end to the manufacturing end. In IS, the development of home shopping will presumably increase the demand for

staff with telecommunications and database skills. The need to invest in the latest technology "just to stay in the game", as Bubb puts it, means that IS professionals will need up-to-date technical skills and, like their counterparts in financial services, the ability to adapt quickly to changes in the environment (Bubb, 1991). As in the FSS, however, there is likely to be growing demand for staff with a broad understanding of the business. As IT has becoming increasingly important not only to the delivery of services but an essential tool of strategic decision-making, IS professionals will need to be as conversant with the business as they are with the technology which supports it.

4.1.3 Forces for Continuity

The changes in the macro-environment described previously have exerted enormous pressures on organisations to introduce changes in the way they carry out their business. It is important to remember, however, that there are also powerful forces for continuity at the organisational and sectoral levels. In Chapter One it was suggested that there is a tendency for organisations operating in the same sector to pursue similar policies or "strategic recipes" in response to external pressures. According to Spender (1989) these recipes arise from shared understanding amongst senior managers of the operational dynamics of the sector and are unlikely to change unless there is a "revolution" in market or technological conditions. It could be argued that deregulation and Big Bang in the FSS constituted such a revolution. Both events, however, were the outcome of a long period of change during which time managers would have had the opportunity to adjust and to follow new "recipes".

Another factor which may promote continuity is the presence of a colloborative network. The latter may be defined as "a shared identity amongst sector members, often sustained by long-standing ties" (Child and Smith, 1987). The colloborative network is a useful channel for exchanging information about sectoral events but also a means of protecting the interests of sector members threatened by the adverse effects of change.

In addition to the sectoral pressures for continuity arising out of shared experience and interests, there are also internal constraints on change. These were described in Chapter One. The culture of an organisation, its structure, the entrenched patterns of behaviour of different groups within an organisation, etc. can all slow the process of change. Some of the internal constraints on change will begin to become apparent in the next section which describes each of the organisations that took part in the research.

4.2 The Case Study Organisations

4.2.1 Company A

Company A is a large financial services organisation employing in excess of 40, 000 people in the UK. It has been established for over one hundred years during which time it has expanded its activities from investing the savings of small depositors to financing multinational organisations. The Company grew by a process of amalgamation until the Second World War when it suffered a major reversal in its fortunes. The growth of domestic and international competition referred to in the previous section, coupled with mounting debts from unwise investments precipitated a financial

crisis. A new management team subsequently took control of the organisation and began to restore it to solvency.

Until this time, the structure of the Company resembled that of a traditional bureaucracy, i.e. it had a top heavy management structure, long chains of command, a strong emphasis on position power, etc. One of those interviewed as part of the study recalled that :

> *There were lots of people on similar grades competing against one another. It wasn't unusual for someone on a high grade to be responsible for just three or four people. They would be trying to build empires to justify their position. There was a lot of duplication of effort and conflict.*

This structure encouraged managers to look after the interests of their own area and reduced opportunities for intra-organisational mobility. It also produced a culture based on a job for life philosophy; a grow your own approach to staff development; high levels of remuneration; centralised decision-making and a paternalistic attitude towards employees.

A range of measures were introduced to deal with these problems. These involved restructuring the organisation - reducing the number of key business areas from three to four - and selling many of its assets in this country and abroad. The decline in the costs of technology enabled management to reduce internal costs further by automation and heavy job losses. The impact of the changes on staff numbers can be gauged from Company records which show that numbers employed in the UK fell from 54,000 in 1988 to 41,000 in 1992. The Company also substantially reduced the number of offices from which it operated.

These cuts were painful but the Company's financial position improved. It was still in debt, however, when it was absorbed into another, larger Group of companies. Although the decision-making structure has changed, the new management has continued the policy of making savings by flattening hierarchies, reducing layers of management and shortening reporting lines. The organisation remains highly centralised, however, and the prevailing management style is conservative and autocratic.

As regards the future of the Company, management's key strategy is to meet the challenge of increased competition by achieving greater integration and synergy between the core elements of the business. A new management structure has already been implemented which will help the Company achieve this. General managers have been appointed to take responsibility for all activities within designated geographical regions and new area managers are taking responsibility for the day-to-day running of operations within local communities. These changes will help the Company "get closer" to its customers and expedite the decision-making process.

The desire to expedite the decision-making process lies at the heart of the Company's new IS strategy. The number and complexity of the systems before the takeover slowed down decision-making and was identified as a major constraint on development. Although the Company had appointed an IT Director in the late 1980's to resolve this problem and achieve closer integration between the IS Function and the main business areas, this did not prove effective. His successor has been charged with the responsibility of rationalising, standardising and simplifying the systems in use. One of the first moves was to consolidate all the back office work into a small

number of regional centres. More recently, work has begun developing a single operating system which will link up managers across the globe and give them instant access to customer data. These initiatives suggest that management see IT as the key to reducing costs and achieving high levels of customer service.

The decision to consolidate back office work into a few key centres has streamlined the structure of the Operations part of the IS Function at the Company. Job losses at the top of the IS hierarchy have also made the organisation leaner and more flexible. The physical structure of the Systems Development Department, however, the other main area of activity in IS has not changed quite as radically. This employs 1,200 of the Company's 2,000 IS staff and is split between two sites located over 200 miles apart. The Department is concerned with planning, designing and implementing technology and systems to meet business needs. Those working in this area design, write and test computer programs; develop new systems; provide user training and deal with conversion and post-implementation and support. Most of the Company's 280 systems analysts are located in the Systems Development Department and it was here that the research which is described in this thesis was carried out.

In the Systems Development Department staff work in traditional project teams concerned with all aspects of the design, development and maintenance of systems. The structure of the department resembles the structure of the Company insofar as it is divided into discrete areas of activity between which there is little mobility. The key change, as far as IS professionals are concerned, is the drive to cut development costs and standardise systems across the organisation. Many staff are working on the systems that will eventually contribute to the single operating system

referred to earlier. The programming is being carried out in-house because management is aversed to employing contractors and consultants. Strong emphasis continues to be placed, therefore, on basic programming skills and abilities.

All IS professionals are given a very firm grounding in programming skills when they join the organisation, regardless of their stated career intentions. Programming courses are part of the Company's two year Graduate Training Programme. This Programmme, which is not part of the Company's general training programme for graduates, lasts for two years and involves placements in IS and the business areas. At the end of the two year period, recruits decide whether to pursue a career in Operations or Systems Development. Graduates generally follow a traditional career path through programming, systems analysis, team leadership and project management. This structure has not changed dramatically over the last five or ten years and most graduates who join the organisation expect to become project managers within the first six years.

The reduction in the number of senior posts, however, means that there are fewer management positions and the Company is looking for ways of encouraging some staff to remain technical specialists. One of these is to recruit A-Level candidates into programming roles and to then encourage them to "stay on the technical side". The drive to recruit technical specialists has made the other career path analysts could follow - business analysis - less attractive. The latter career path was introduced into the Company ten years ago when there was a concerted effort to make the IT Division more responsive to the needs of the business. Most of the business analysts then (and now) were recruited from a technical

background. They constitute a small minority of the IS workforce (the Company currently employs 25 business analysts) and are located on a different site from the Systems Support staff.

Company A has not overhauled the career system in the Systems Development Department during the last few years but the Personnel Department has distributed a new Career Review. This explains the structure of career opportunities at the Company, provides guidance on the competences that are required at different levels and offers advice on what IS professionals need to do in order to advance to the next level. Provided that they can demonstrate these competences in appraisal, they can apply for promotion to the next level. In producing the Career Review, Company A is providing the guidance that will enable staff to manage their own career. While this represents a slight shift in culture, the Company has not moved away from the concept of career management and retains a paternalistic attitude towards its staff.

4.2.2 Company B

Like Company A, Company B is a financial services organisation whose history extends back over a hundred years. It grew from relatively small beginnings by a process of amalgamation and gradually built a substantial client base in this country and overseas. Whereas Company A's fortunes declined in the postwar period, Company B enjoyed a period of very rapid expansion. The number of new customers increased dramatically and the Company was able to greatly strengthen its capital structure.

Much of the Company's success was the result of shrewd investment decisions and a business strategy based on very clear customer

segmentation. This strategy lay behind the decision in the late 1960's to integrate the retail and corporate arms of the Company and reorganise global operations into five separate business units, each of which would be targeted to meet the needs of a clearly defined segment of the market. Instead of pursuing a policy of expansion, the basis of its early growth, it focused instead on its core businesses and sold off unprofitable parts of the Company.

Company B has enjoyed a period of remarkable expansion but, like Company A, it has been strongly affected by the general changes taking place in the financial marketplace. The growth of domestic and international competition and changes in the pattern of demand, particularly, have prompted it to examine ways of creating a more flexible structure. Like Company A it has reduced the number of its offices in the UK. There were over 2,500 outlets in the mid 1980's. It currently supports 1,800. The Company has also made significant staff cuts. In the mid 1980's it employed over 70,000 people in the UK. By 1990, that figure had declined to 67,000 and currently stands at just over 62,000. Some of the job losses have been amongst managers. There has been a concerted effort to reduce layers of management, flatten hierarchies and shorten reporting lines. This means that although it is strongly oriented to developing managers - over 4,000 of its staff hold management positions - there is less scope for career advancement in the traditional sense. Like many other companies, it can no longer guarantee a job-for-life, promotion based on seniority and high levels of remuneration. Current trends suggest that the Company is developing a culture based on a less directive management style; greater devolution of responsibility; a results-oriented system of remuneration and expected higher turnover of staff. Many managers recognise that the transition to this type of culture over the next few years

is likely to cause problems and may result in a loss of staff loyalty. They believe, however, that changing the culture of the organisation is essential to respond to market changes.

At a strategic level, the Company is responding to "market changes" by focusing on its "core operating areas" and by developing a "virtual integrated organisation", i.e. one that is disaggregated into separate business units which operate autonomously but are supported by central management. The key advantage of this highly decentralised structure is that it will enable the Company to sell off parts of the organisation if the need arises.

Information technology will be the key enabler of this change. Like Company A, Company B has taken advantage of the falling costs of computing and invested in systems that will support key operational and strategic aspects of the business. Technology is also viewed as the means of communication that will keep the separate business entities described above working in a loose federation. The IS Function at the Company currently reflects the decentralised structure of the organisation, with each of the divisions having their own IS department and operating fairly autonomously. Each of the divisions has its own systems and employs staff with expertise in the use of those systems. In all, the Company employs 2,000 IS professionals, including contractors. Of these 300 are "systems analysts".

The research described in this thesis was carried out in the retailing division (R Division) of the Company which caters for the needs of high street customers. The IS Department in R Division is the largest in the organisation with a staff of 1,400 and is divided into two main areas:

Operations and Development. All of those who took part in the research were based in the Development Section which employs 500 IS professionals. According to one of the senior managers, there has been more change in the IS Department over the last five years than there has been in the last thirty. Until the early 1990's, it was "expensive, slow and unresponsive to the business's real needs". The appointment of a new general manager heralded important changes. All the different sections within the IS Department in R Division were brought under one umbrella with the aim of creating a more integrated, customer oriented service.

The Development Section has moved faster in the direction of delivering an integrated, customer driven service than other sections of the IS Department. Under a new manager, it has introduced a new system of resource pooling. Resource pools are groups of staff headed by a Resource Manager (RM) whose job is to allocate work and monitor careers. Most RM's have a pool of about sixty members of staff from which to draw when project managers notify them of a vacancy on a project. Staff are then expected to undertake work on the project to which they have been assigned.

The two key advantages of this system, from management's point of view, are that it is a much more effective way of deploying staff resources than the old system, where staff's skills could be under-utilised on a project, and it frees the project manager from many of the administrative responsibilities of the traditional project manager's role. The new system will also increase staffs' repetoire of skills and experience because they are assigned to work on many different types of project.

As the last point suggests the company is keen to encourage multi-skilling and mobility between projects. Over the last few years it has deliberately sought to promote multi-skilling by recruiting into IS, staff who are "good all-rounders". Not all are graduates, but those who are, come from a variety of backgrounds. Graduates who embark on a career in IS at the Company are placed on a Graduate Training Programme. Each Division runs its own version of this, all of which are different from the Bank's generic training programme for graduates. In R Division graduate recruits are given a 16 week training programme and then spend the next twenty months in different placements to broaden their experience of the role of IS at the Company. Once the initial training has been competed, graduates join one of the "families" (job clusters) in R Division. Those who join the Development family, i.e. the Development Section start off as analyst/programmers and can then progress to become senior analyst programmers and project managers and eventually senior managers. The management grades have recently been revised to include provision for specialists, i.e, people who do not want to advance their career through management. There are few openings, however, for technical specialists. Part of the reason for this is that the technology has become easier to use. The Development Section, for example, has recently poured millions of pounds into creating a new software tool that will enable users to develop their own applications. The growing ease of use of systems, coupled with general changes within the business has therefore shifted the priority to developing staff with hybrid skills.

It was the desire to create hybrid professionals which prompted management to create a special section composed of twenty-six business analysts (BA Section). Until quite recently, this section was outside the IS Function and was perceived to be a discrete area of expertise. While the

business analysts it employed could be called upon to investigate any business problem, they would often undertake the initial requirements gathering and assess the feasibility of an IS project, tasks that are usually considered part of role of traditional systems analysts. It was to take advantage of these investigatory skills, and to improve the IS Department's links with the business, that the BA Section was brought within the Development Section in R Division. Business analysts are currently on the same grading structure as developers but are not yet part of the resource pooling system. If they are put into this system, the group will probably be split up and their expertise seeded in the different resource pools. This would be consistent with the Development Section's general aim of encouraging a multi-skilled IS workforce.

4.2.3 Company C

The third company that took part in the research is also a financial services organisation but, unlike the other two, it came into existence only a few decades ago. The Company currently provides financial services to a wide range of customers in this country and overseas. Like the other companies included in the research, it employs large numbers of staff in a variety of locations - 58,000 people are currently on the payroll, 2,000 of which work in IS.

The Company is split into divisions, each catering for different clients - individuals with small or large amounts to invest, small businesses, major corporations, etc. and has offices at the local and regional levels. The size of the business grew considerably during the 1980's, mainly because parts of the organisation were located in geographical areas which benefited from the boom period of the Thatcher years. The forces for

change described in the previous section, however, have produced a downturn in its fortunes.

To reverse this, and meet the challenge of increased competition in the marketplace, the organisation implemented a major programme of change in the early 1990's. Over the last few years, it has significantly restructured the business. The Company's main operating divisions were increased from three to four and each were given considerable autonomy in achieving pre-set performance targets. At the same time, the Company reduced the number of regional and local offices it supported and cut staff numbers. In 1989 it employed over 70,000 people in the UK. By 1994 this was down to 60,000.

The key to the success of the change programme is more effective use of technology. As one of the senior executives of the Company observed:

> *Fundamental to reshaping our business to meet our customers' needs is our investment in technology which we are driving through all our businesses. We need to harness technology to deliver an enhanced service.*

The Company had begun investing heavily in new technology in the mid 1980's. Between 1984 - 1989, it invested £500m on new systems. The figure for 1988 - 1993 was in excess of £1 b. As the Company has endeavoured to cut costs and improve global efficiency, technology has become vital to the delivery of services. The reduction in the number of regional offices, for example, meant that it needed alternative methods of delivering financial services. The solution was to take advantage of advances in technology and invest heavily in telecommunications. Like many other financial

service companies, an increasing proportion of its business is now conducted remotely using sophisticated telecommunications equipment.

As the delivery of services has begun to change, the skills and knowledge of the workforce is also starting change. There is now less need for basic clerical skills and increased need for customerfacing skills and personal selling. Changes in patterns of demand and in customer expectations have prompted a much greater emphasis on serving the needs of the customer. The latter is at the heart of the Company's long-term business strategy. As one top manager observed:

> *The key to of our vision for the future is the recognition that the customer is king. ... in dealing with our customers today, the competitive environment suggests that a financial services organisation which is not obsessive about the needs of its customers will not survive. Our strategy, therefore, is to offer and deliver outstanding service, efficiently and at an acceptable price.*

This emphasis on customer service has increased awareness of the need for a cultural change within the organisation and for more effective approaches to human resource management.

> *Previous command and control and narrow activity-based human resource approaches will be less useful for the future when teamwork, openness, customer and performance focus is required.*

The determination to bring about cultural change is evident in the recent restructuring of the the IS Function at the Company. "The business user is King" could be the new watchword of IS Function as it strives to achieve a closer alignment with the business. To provide a high level of service, the

building a small number of major processing centres which will handle all the back office work.

In addition to this change, the Company has revamped the Systems Delivery Section of Group IS. This is where most of the Company's 300 analysts work and where the research described in the thesis was carried out. Delivery is currently divided into a number of "Towers", each of which looks after the systems in a particular part of the business. Every Tower has a head who liaises directly with the relevant business area. A human resource consultant works with each of the Tower Heads to oversee the allocation of work and to deal with a range of personnel issues.

Changes in the structure of the Delivery Section have led to major changes in the career system. Hierarchies have been flattened; job descriptions have been replaced with role profiles; grade bands have been broadened and a new Technical Consultants' grade has been introduced. Of these, the most significant change is probably the introduction of role profiling. The Company has abandoned the practice of writing job descriptions because roles tend to be more broadly defined in a flatter structure and given each member of staff a role profile instead. The profile is created by the individual's line manager and is based on their stated competences and interests. It is kept on a database and used to match individuals to internal job vacancies.

The introduction of role profiling is a key part of a new "career culture" which emphasises greater individual responsibility for career management. With less scope for vertical mobility, fewer executive positions and less job security, the Company can no longer guarantee a job

for life or incremental career moves. The new career culture is reflected in recently revised procedures for recruiting, training, appraising and promoting staff. With regard to recruitment, for example, the Company has switched from recruiting graduates from a technical background to good all-rounders. The aim is to ensure that the staff who fill analyst/programmer, team leader, project management and (in a few cases) senior manager roles have the ability to deal effectively with the business.

The Group's procedures for training staff have also been revised. Staff are currently being helped to update themselves on the new technologies through Out-of-Hours Training provided at the Company's expense. This is in addition to the Company's IT Graduate Training Programme and the other courses it runs in technical and management skills during the day-time hours. The methods used to appraise staff have changed in line with the greater Company-wide emphasis on improving performance. A new system has been introduced called "Partnership -In- Performance". This is divided into two parts. The first requires the appraisee to identify what they have to do in their role within the next six months and what will enable them to be successful. In the second part the appraisee identifies what competences are required to do their job and assesses their present competence in relation to these requirements. If there is any disparity a decision is taken about what can be done to close the gap.

As part of the general policy of encouraging greater personal responsibility for careers, the Company has introduced a number of measures to stimulate mobility in IS. Instead of being allocated to a project, for example, staff are being advised to nominate themselves for jobs. Project managers, who may have a vested interest in retaining staff, are being

encouraged to release them from their project if they want to work elsewhere. Eventually it is hoped that IS staff will not only move around more freely in IS but they will also be able to move out into the business areas. At the moment there is an influx of staff into IS but limited movement out of it.

The Company recognises that low levels of mobility out of IS may result in excessive functional specialisation and have attempted to overcome this problem by bringing business analysts from the business areas to advise on the early stages of the systems life cycle, defining requirements, investigating the feasibility of projects, etc. As such they are carrying out many of the tasks associated with the systems analyst's role. Management argue, however, that they are more business-focused than the systems analyst. The latter role tends, in practice, to be carried out by analyst/programmers. The analysis and programming functions have been combined, as in some of the other organisations. Analyst/ programmers tend to be more involved in the technical aspects of development and come from a technical background though many will follow a management career in IS.

4.2.4 Company D

Company D is a large retailer with outlets in most parts of Britain and interests on the Continent. It started life over half a century ago as a small store selling items at a modest price and has grown to become one of the UK's most successful retailers with an estimated turnover of in excess of 10,000m. The Company currently has over 90,000 employees, 500 of which work in central IS at headquarters.

The last ten or fifteen years have witnessed enormous changes in the way the organisation operates. Like many other large retailers, it expanded rapidly during the 1980's. The relatively favourable economic conditions described in the previous section and buoyant customer demand led to a massive growth in sales. This in turn provided the capital to finance a major store construction programme. The number of stores increased from 200 in 1979 to 262 in 1989 and, over the same period sales grew from £1,006m to £3,903m. To counter the threat from rival companies, including overseas traders, the Company also began diversifing into new business areas in this country and forming strategic alliances with traders in other countries.

Advances in technology, described in the previous section, played a significant part in the Company's success during this period. Scanning techniques were introduced in the stores in the mid 1980's, an innovation which gave the organisation "a huge competitive advantage" because it provided management with access to accurate information about the sales of each product. The Company also introduced new branch ordering systems. An integrated ordering procedure was implemented which established a link between the branches, head office and the depots. Orders were sent direct to head office from the stores and then to the depots to be assembled, thus enabling the branches to carry only the stock they were likely to sell. More recent work in this area has made use of point-of-sale information provided by scanning to anticipate future demand for products.

The Company continued to expand during the early 1990's but economic recession reduced the amount of money available to spend in the shops and competition from foreign discounters intensified. The Company's

store expansion programme also slowed down because of the difficulties of obtaining planning permission. To retain its position, and compete more effectively in future, the Company was forced to introduce far-reaching changes in the way the business was organised. Over an eighteen month period, a major change management programme was launched which involved rationalising head office operations (400 staff were made redundant) and re-engineering the business. In place of business functions, the Company identified a number of key business processes, relating to the development, distribution and sale of products, the management of people and store maintenance. All of these processes were to be interdependent. Members of staff were assigned to work in the business processes.

The IS Function has been directly affected by these changes. Instead of working as members of teams on projects in central IS all those working on the development, delivery and maintenance of systems have been reassigned to work on teams in one of the processes. Teams are composed of IS professionals and users seconded from the business and are often headed by a senior manager from the business process. IS professionals report through the line to the Business Systems Manager for a particular process and he/she reports to a senior manager in the business, thereby ensuring a high degree of accountability to those who "own" the systems.

While IS professionals have, in a sense, been redeployed to the business, the Company has retained a central IS Department and staff are still physically located quite close together. The main aim of the restructuring was to forge a closer alignment between IS and particular areas of the business. IS professionals are expected to accept "cradle to grave

responsibility" for systems in their process and to develop long-term relationships with business users in that process.

To operate effectively in this environment staff needed a greater awareness of the business and good user-support skills. To enhance the business orientation of IS professionals, the Company introduced a number of measures. The most important involved "revamping" the business analyst role. Before the reorganisation, the Company employed teams of business analysts within the IT Division to undertake exploratory work on projects, liaise with clients in the business areas, etc. Most came from a technical background and, though technically very competent, did not know enough about the requirements of the business to carry out the role effectively. As part of the restructuring, the Company recruited thirty users with substantial business experience into the role and assigned them to work on particular projects. A number of IS professionals have also become business analysts but all were chosen because they had a very strong business orientation.

Key elements of the career system have also been revised to reflect the importance the Company attaches to business values in IS. In terms of recruitment, the policy is to employ generalists, particularly business studies graduates. The latter have the choice of three career paths in the Company's revised career structure. The "management" career path extends through analysis/programming, team leading and project management and eventually leads to a senior management position. Note that there is no generic systems analysis job category. The Company converged the analysis and programming roles a few years before the restructuring to make the more technically oriented staff responsive to the business. The business analyst career path is a direct outcome of the

restructuring and consists of three levels - the highest of which is a senior position. This involves work at the strategic level of the business but does not entail significant people management responsibilities. The third option is to become a technical specialist working in Operations or Technical Infrastructure. Those who follow this path will be part of the IS Department rather than a business process and can remain specialists or move through the grades to become a technical project manager. Regardless of which path they follow, staff who reach senior positions need to demonstrate both technical and non-technical skills. The recent introduction of new competency ratings in appraisal which lay emphasis on attributes such as motivational and leadership skills underlines the importance attached to business/management skills.

The Company's approach to training IS professionals has also changed as a result of the restructuring and the effect, once again, is to encourage business awareness. The main initiative has been the introduction of training programmes on the Company's new approach to project management. Before the restructuring, there was concern about the lack of standardisation in project management and the adverse effects of this on the delivery of systems. The new approach requires teams to "deliver" small parts of a project at pre-defined stages. The training programme explains these stages and the skills needed to deliver systems on time and within budget.

The changes described above are intended to create a more flexible workforce. The Company is quite explicit in its intention of creating hybrid IS professionals. Management believe that greater flexibility is essential to make the most of the new technologies it is investing in - open systems, generic office systems, groupware, etc. and to cope with radical

change in the structure of the business. One of the key changes, for example, is likely to be the move into "home shopping". This would entail building a technical infrastructure that goes into the homes of people and a distribution infrastructure that delivers goods to the home. Developing this architecture would call for a very wide range of technical and business skills.

While the introduction of new technologies and possible advent of home shopping make the future seem exciting, it will be up to staff to make the most of the opportunities which arise. Like the other companies that have taken part in the research, Company D is keen to encourage staff to be proactive in managing their own career and promote awareness that a job with the organisation may no longer be for life. This represents a significant change in the Company's culture - it has traditionally been quite paternalistic and bureaucratic - but is a reflection of changed market conditions and the need to become that much more competitive.

4.2.5 Company E

The fifth organisation that took part in the research is also a retailer and, like Company A, is part of a larger organisation. Established over sixty years ago, the Company has grown steadily over the years and now has over 700 stores nationwide and employs a total workforce of 48,000. The Company enjoyed a period of considerable expansion in the first few years of its life but struggled to cope with the growth of increased competition, particularly from overseas companies, fluctuations in the pattern of demand and economic recession. The root of the problem, however, was poor management. The Company has experienced numerous changes of

management over the last twenty or so years usually in response to a financial crisis which management had failed to avert.

At the end of the 1990's, before the most recent change of management, the Company had accumulated debts of over £450 million and appeared to be on the brink of collapse. It was described by one senior manager at the time as "a sick giant, suffering from a lack of identity and chronic under-investment". Under the direction of a new chief executive, the Company has reduced its debt and recently announced profits in excess of £50 m. This improvement in its position is the result of a new strategy aimed at establishing Company E as a value-for-money shop operating from the smaller high street and out of town stores. As part of this strategy, a major refurbishment programme has been implemented to rid it of the rather old fashioned image it had acquired and all of the 1,000 different items it sells have been competitively priced.

Management structures have changed to support the need for greater flexibility. In a cost cutting initiative the numbers of staff were reduced. In 1991 it employed over 50,000 people. By 1995 this figure was down to 48,000. The strong emphasis on reducing costs has influenced the culture of the organisation. One senior manager described it as "conservative, cautious, command and control-centred". Under the previous Chief Executive, there was a much greater emphasis on creativity, entrepreneurialism and innovation. While the new ethos seems to be consistent with the way the Company developed in the 1960's, the "blue skies, green fields" philosophy of the old chief executive probably suited the culture of the Company's Systems Department, rather better.

The Systems Department at Company E is centrally located and employs 250 people. Of these, 110 work in Operations; the remainder are in the Development Unit. There are 28 systems analysts in Development and 12 business analysts; the rest of the staff are either project managers and programmers. The Systems Department has a head (who reports to the Director of Finance) and five senior managers. The recent cost-cutting initiatives have not made a major impact on staff numbers but the four account executives the Department used to interface with the business were made redundant. While this means that there is no-one to "sell" the System Department's services to the business areas, the Company recently appointed a number of business analysts to develop a closer relationship with the business. Many of these were recruited externally from other companies and were selected for their commercial knowledge rather than their technical skill. The business analyst is regarded as a senior person within the department and is paid at a higher rate than systems analysts whose role, according to management, is more concerned with the technical aspects of building systems.

The development of the business analyst role (and associated career path) is the key change that has taken place in the career system since the takeover. Most staff continue to follow the technical or project manager routes. Unlike Company D, Company E has not changed its human resource policies to encourage the recruitment of hybrids. Graduate recruits are selected for their technical competence and are placed on a special scheme for IS. The Company does employ analyst/programmers but emphasis is placed on strong technical abilities and most staff will have technical qualifications and/or experience.

All the staff who took part in the research were located in the Development Unit which is organised on the basis of project teams. The teams are led by a business manager who will have been seconded to the team for the duration of the project. The latter is responsible for the direction of the project but has no budgetary control. Before the change of management a few years ago, project teams faced out to the business so that one would be responsible for the area of the business dealing with suppliers, trading, marketing, etc. In recent years, project teams had simply been formed to work on specific problems, regardless of functional area. In the weeks prior to the research being undertaken, the Unit had been restructured and teams were once again assigned to work in partnership with a specific area of the business. As at Company D, the aim is to develop staff with knowledge and skills in particular areas of the business. As part of this restructuring, the Company has eliminated the post of Resource Manager. The latter were specifically appointed to manage the careers of IS staff and carried out a similar function to the Resource Managers at Company B. The decision to eliminate the post was part of a policy of decentralising responsibility for human resources to line managers.

Greater knowledge of the business will certainly be needed if the Company is to derive maximum benefit from the massive investments in new technology it has made over the last few years. Management see IT as one of the key means of improving its competitive position and have invested very large sums in advances in technology. Although it still relies heavily on mainframe technology, and will continue to do so, the Company is moving in the direction of UNIX and open systems and training staff in the use of new approaches to systems development such as Rapid Application Development. Like Company D, it is seeking to improve its

links with suppliers, and has recently developed systems that will facilitate co-managed inventory. The system enables suppliers to use daily updates about sales, together with shared knowledge of planned promotions, to replenish stocks without being asked. By closely monitoring sales to customers, suppliers will have more accurate and timely information about what data is required and will be able to respond more quickly and flexibly to changes in demand. Company E will make significant savings on stock and invoicing and will be able to offer customers a superior service.

Heavy investment in new technology has created new opportunities within the Systems Department and preserved it from the most swingeing cost-cutting. As the new developments are completed over the next few years, however, the Systems Department will become more vulnerable. Routine work is likely be outsourced and the organisation will move in the direction of creating a core of highly skilled staff and employ more contractors on a temporary basis. It is thus likely to become smaller and require a broader range of both technical and specialist skills. This would suggest that its long-term need is for IS professionals with hybrid competences.

4.3 Summary

This Chapter has described the case study organisations that took part in the research. Three of the organisations - companies A, B and C are financial service organisations: the other two, companies D and E are retailers. There are similarities between the organisations which reflected the influence of sectoral factors - all the companies operate out of a branch network which is the main distribution point for the product or service;

they all deal with large volumes of transactions and are entirely dependent on IT. There are also differences between the organisations which reflect sectoral influences, i.e. the core businesses are different; the culture of the organisations and the types of systems used differ.

All the companies that took part in the research shared certain structural similarities. Thus, all were large organisations, employed thousands of staff, had been established a long time and maintained a branch network which extended throughout the UK and (in four of the five cases) overseas. They had also been subjected to similar pressures in the external environment over the last ten to fifteen years, particularly increased domestic and international competition; changes in the patterns of demand; the emergence of new social attitudes; demographic changes and advances in technology. These changes, combined with internal pressures, had resulted in dramatic change in each of the organisations during the last six years (the period covered by the investigation).

While all the companies had been confronted by similar external pressures and pursued broadly similar strategies to cope with these, the nature and effects of these changes were contingent on the situation and highlight important differences between the companies. This was reflected, for example, in differences in the IS and human resource strategies pursued by the companies. Each of the companies had different policies for managing the IS division/department and IS professionals; different internal arrangements for allocating work and for developing staff.

In all the organisations there were forces that constrained the impact of change in roles. These often arose from the structure and culture of the organisation, the interests of particular groups, etc. Management had

attempted to overcome some of these constraints through the implementation of new policies or, in two cases, the launching of a formal "change" management programme. The success or otherwise of these initiatives will be the focus of chapters Five and Six.

END NOTES

1. This "operational" definition of the financial services sector was derived from books by Drew (1994) Revell (1973) and Maycock (1986); the keynote reports on retail banking and the building societies and the 1986 Financial Services Act which defines a financial services organisation as one that carries out "investment business".

2. This very broad definition was based on the keynote report on retailing (1995) and a chapter by Ford in Ricketts (ed.) 1991 and the section on retailing in the United Kingdom in Eurostat (1993).

3. Information supplied by the Corporate Intelligence on Retailing

4. The impact of recession is reflected in the annual average rate of growth in retail sales during the latter part of the 1980's and early 1990's. The annual average rate in all retail sales between 1990 and 1994 was was 1.6% which is almost half that of the annual average of 3.2% achieved from 1986 to 1990. Keynote Report 1995.

5. The number of retail businesses fell by 14.4% between 1990-94 and the number of outlets by 13.8%. Sales grew by only 6.8% over the period.

6. It is interesting to note in this connection that a recent Gallop Poll found that only 15% of those sampled actually preferred shopping out of town.

7. In 1995 the Environment Secretary promised that guidelines to cut out-of-town superstore development. This was to be achieved by reforming Planning Guideline PPG6 which instructs local councils to to take account

of the vitality and viability of town centres before granting permission. Keynote. p. 203.

8. Information supplied, on request, by IS managers at the respective companies.

CHAPTER FIVE

The Analyst's Role: Specialisation or Hybridisation?

5.0 Outline of Chapter

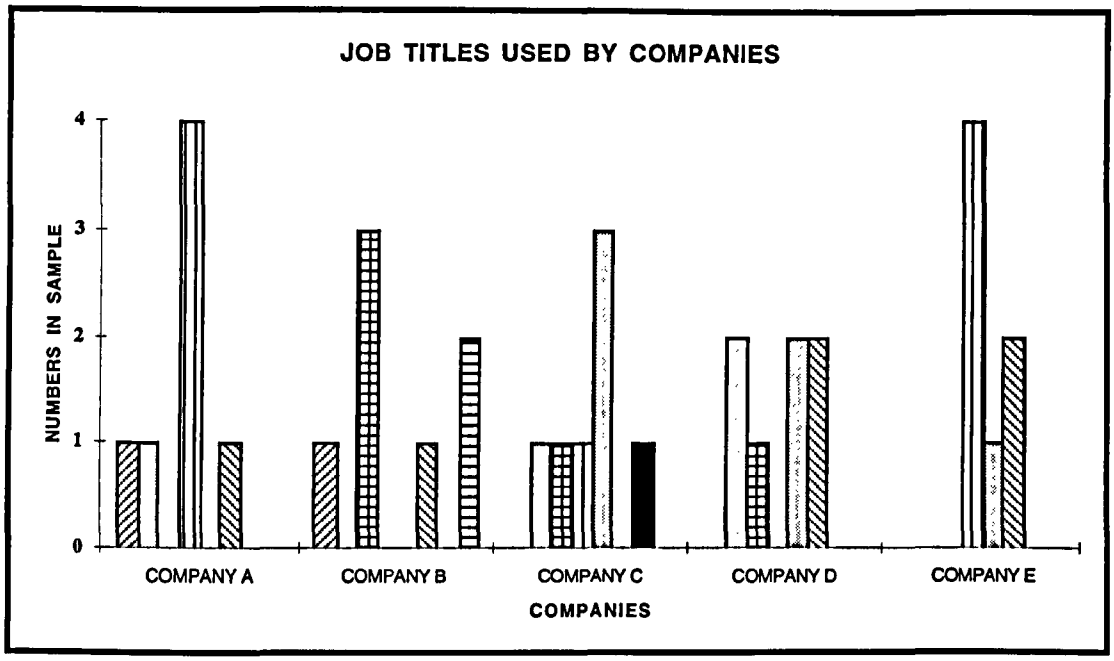
In Chapter Two it was suggested that the main thrust of development in the systems analyst's role has been towards enhanced business and general competences. This Chapter examines whether the roles of the analysts who took part in the investigation have become more business-oriented or specialised. The Chapter will demonstrate that the content and scope of the analyst's role is largely determined by the organisational context but that the analysts' interests and abilities are important in influencing whether their role is defined in business or technical terms. It will be shown that in three of the companies that took part in the research, the analyst's role is defined in technical/specialised terms. In the remaining two their role, though more broadly defined, is still constrained in a variety of ways. In all the organisations the business analysts occupy a higher status than the systems analysts but in two the business analysts are clearly perceived to be rising stars.

5.1 The Sample

5.1.1 Job Title

All the analysts were asked to specify their job title. Although job titles are not a reliable guide to the content of a role, it was felt that this would nevertheless provide an initial indication of how the organisations were defining the systems analyst's role. Chart One identifies the range of job titles and the proportion of the sample that held each title.

Chart One: Job Titles



Key to Chart

	Analysts		Systems Analyst
	Business Analyst		Business Systems Manager
	IT Consultant		Analyst/Programmers
	Team Leaders		Business Consultant

The most striking feature of the chart is the diversity of job titles. Some members of the sample are systems analysts, others are business analysts and quite a few are team leaders or consultants of one kind or another. A substantial number occupy a fairly high status. Every company has included some senior and principle analysts but also some members of staff who are lower in the hierarchy.

Closer analysis of the Chart suggests that nine members of the sample have the title "systems analyst". Six have the title "business analyst". Although the use of the title "business" as opposed to "systems" analyst might simply reflect differences of nomenclature, the findings suggest that this is not the case. For one thing, all the companies which use the title "systems analyst" also employ business analysts - they are two separate job categories. Also those companies which have ceased using the systems analyst job title (companies B and D) still make a distinction between "analysts" or "analyst programmers" and "business analysts".

Those members of the sample who are not "analysts" fall into one of two categories: they tend either to be consultants or team leaders/managers. With regard to the former, there are two technical or IT consultants and one business consultant. The contrasting job titles seem to indicate that a distinction is being made between the technical and non-technical aspects of the work. This is underlined by the inclusion in the sample of a number of project/team leaders and "managers".

5.1.2 Location

In Chapter Two it was suggested that physical location can exert an important influence on the degree of specialisation/hybridisation within a role. The analysts were therefore asked to state where they were located in their organisation.

All worked within different departments in a large, central IS division/department. At Company A, the analysts worked in two different departments on different sites. Six were located at Site 1 in the north of England and the other one was located at Site 2, which was 200

miles away to the south. Three of the analysts at Site 1 worked in a section that was responsible for Administrative Systems for the Company. The other four worked for a section which dealt with management information systems and was split between the two sites.

The situation at Company B was less complex. All the analysts were located in the south of England and were drawn from the same department. They were physically located close together and worked on systems that dealt with the retailing aspects of the Company's business or, in the case of the business analysts, were involved in tasks that could take them into any part of the organisation. At Company C most the analysts were also physically located close together at a site in the south of England (Site 3). However, two of those interviewed were employed one hundred miles from central IS in the south west and were accommodated in different buildings (Site 4). All worked on systems for different parts of the organisation.

The analysts at Company D were employed at the same location in the south of England but worked on systems in different "processes" within the organisation. A similar situation obtained in Company E, which was located in the south west of the country, except that the analysts were not part of any "process"; they simply worked in small teams that dealt with systems for different parts of the business, e.g. buying, store maintenance, etc.

The question arises of whether differences in the regional location of the sample had any impact on the findings. Most of those who took part in the research were located in the south of England - a small proportion - six members of the sample, all at Site 1, Company A worked in the north.

When they discussed their career aspirations, it became apparent that regional location influenced the analysts' feelings of job security. Those located in the north felt less job security than those in the south because they believed that there were fewer job opportunities [1]. Although this may result in differences in turnover rates, management confirmed that turnover rates were low at all the companies. Regional location did appear to be important in influencing the analysts' attitudes towards the Company, however. The analysts at Site 1 commented that the perceived difficulties of obtaining another job in that part of the country tended to encourage loyalty to the company.

5.1.3 Gender

The research was not specifically concerned with gender issues but it was clearly important to take account of the proportion of males/females selected. Twenty-four members of the sample were male, eleven were female. Although this strong bias in favour of men seems to suggest that systems analysis is a "male preserve", some companies chose almost as many women as men. Companies C, D and E each selected three women and four men. Also, although there are fewer women than men in the sample, this is not unrepresentative of general trends in the industry. Statistics compiled by Virgo on behalf of the Institute for Data Processing Management indicate that women comprise 22 per cent of the analyst/programmer workforce (Virgo, 1996) [2].

A rather different issue is whether gender would influence the nature of the analyst's role and their perceptions of the change process. Gender studies would suggest, for example, that women might occupy lower status positions or be less critical of management policy than men (Coyle

and Skinner, 1988; 1984; Beck and Steel, 1989) [3]. There was no evidence of this in the research. In all the case study organisations, the women tended to occupy the higher status positions. With regard to their perceptions of organisational change, the women tended, if anything to be more critical of management actions than their male colleagues. The key difference to emerge between the sexes in the sample was that the women tended to be *more proactive* in managing their role and career.

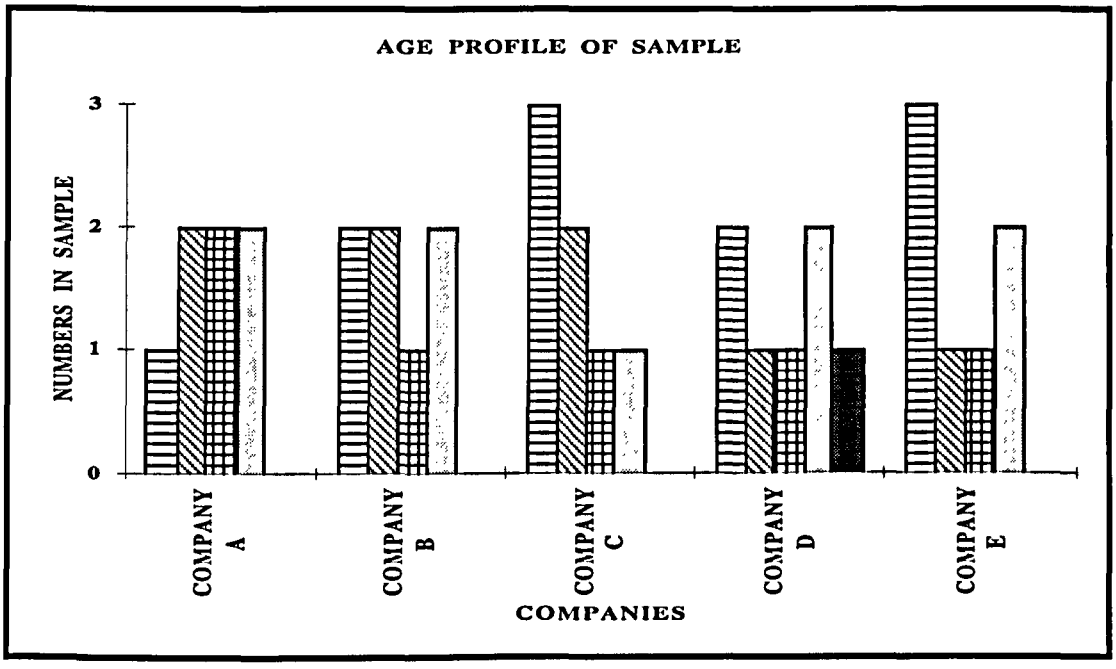
5.1.4 Age Structure

All the sample were asked to state their age to determine how much experience they had and to assist in interpreting the data on career development and aspirations. Chart Two over page provides a breakdown of the ages of members of the sample. It will be seen from this that the sample is composed of experienced people. No-one was aged under twenty-five and ten were over forty. The average age is relatively high at 34 years. It could be argued that a significant proportion of the sample have plateaued in their career. If age and position are correlated, it is clear that the careers of some members of the sample have levelled off. The average age for analyst/programmers, for example, is 34; for "systems analysts" it is 37.

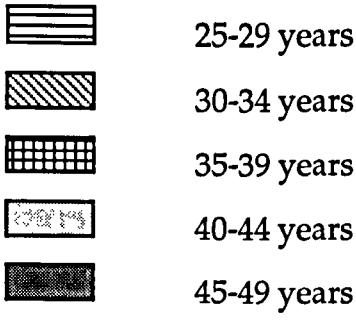
There are eight people in the sample who are leading a team or have the word "manager" in their job title. Of these only four are aged under thirty. The average age of team leaders/managers is 33 years. The fact that so few have achieved managerial status and that most of those with managerial responsibilities are older than expected may be a reflection of the individual attributes of the sample or it may point to a fundamental shift

in career patterns in the case study organisations. Data presented later in this Chapter and in Chapter Six suggests that both may be relevant.

Chart Two Age: Profile of Sample



Key to Chart

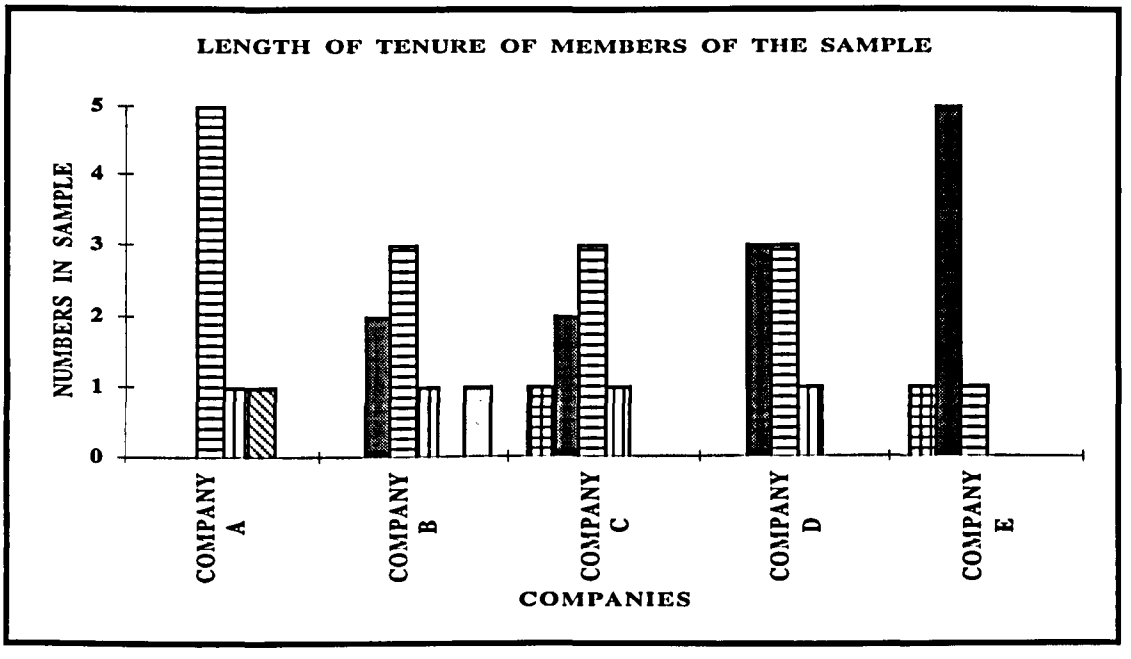


5.1.5 Length of Tenure

It was important to establish how long the sample had worked in their present organisation for two reasons. Firstly, to provide a time-frame for the research. There was little point investigating change in roles over a

period much longer than those interviewed could recall. Secondly, to ascertain how much actual knowledge of the organisation each of the respondents possessed. The longer they had been with the organisation, the more knowledgeable they would be about it and the more "change" they would have experienced. Chart Three provides a breakdown of length of tenure:

Chart Three: Length of Tenure



Key to Chart

	1-11 months		10-15 years
	1-4 years		16-19 years
	5-9 years		20-25 years

It will be seen from this that a little under under half the sample have been with their current employer for 5-9 years, and nearly a third had been with their Company for 1-4 years. The average length of tenure is just over

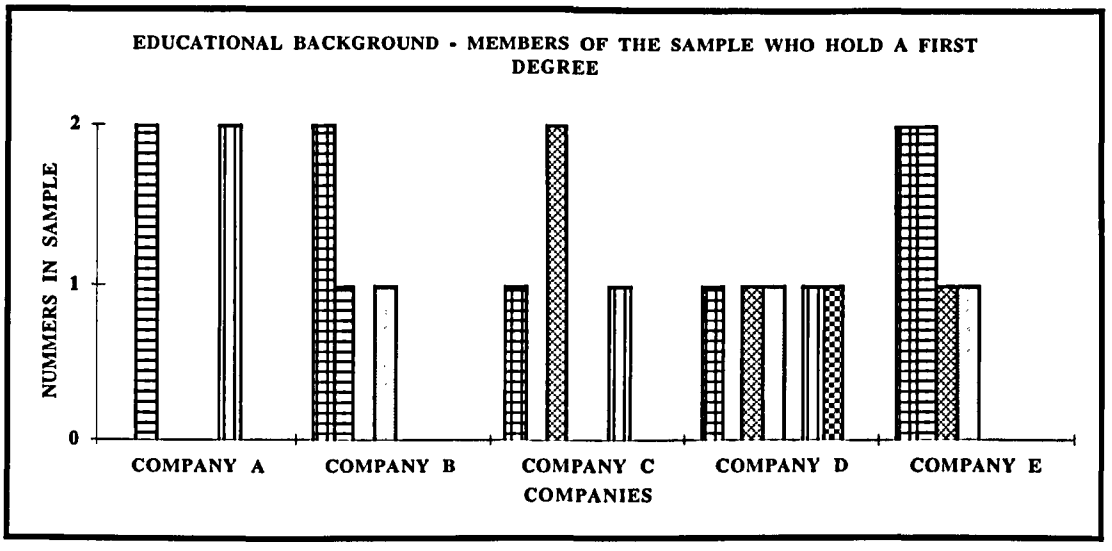
six years. This suggests that the sample are likely to be fairly knowledgeable about their organisation.

5.1.6 Educational Background

Members of the sample were asked to state their educational qualifications to provide an insight into their interests and also to ascertain whether the case study companies had been recruiting people from a generalist or specialist background. The results indicate that twenty-three members of the sample have a first degree, four are educated to masters level and fourteen hold professional qualifications. Chart Four over page shows the proportion of respondents in each company that held a first degree by subject.

The Chart indicates that, of those who hold a first degree, eleven are in a science or computing related subject; four in an arts subject; three in social science and just one in a business related subject. Although the companies are employing some arts and social science graduates most are showing a preference for scientists/technical specialists. The same pattern can be found for higher degrees. Only four members of the sample hold a higher qualification and of these three are in science or computing.

Chart Four: Proportion of Sample with a First Degree



Key to Chart

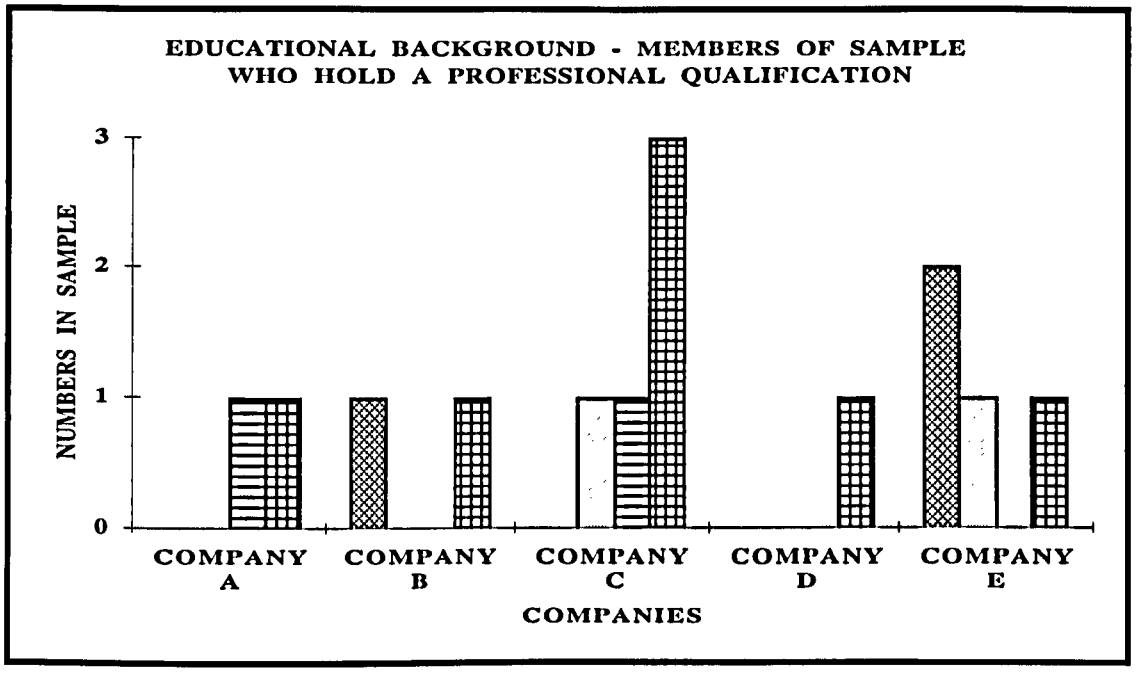
	Computing		Arts
	Science		Social Science
	Maths		Hybrid - Engineering and Business

The reverse is true for professional qualifications. Chart Five over page indicates that approximately a third of those who have a professional qualification have been accredited in a science or computer-related subject

This may be because some had worked outside computing before they joined their present employer and needed a professional qualification in order to practise or it may be that they felt it would help them in their present position. The findings point to the former explanation. None of those who took part in the research felt that professional qualifications

made any difference to the performance of their role or their career progression.

Chart Five: Professional Qualifications Held by Sample

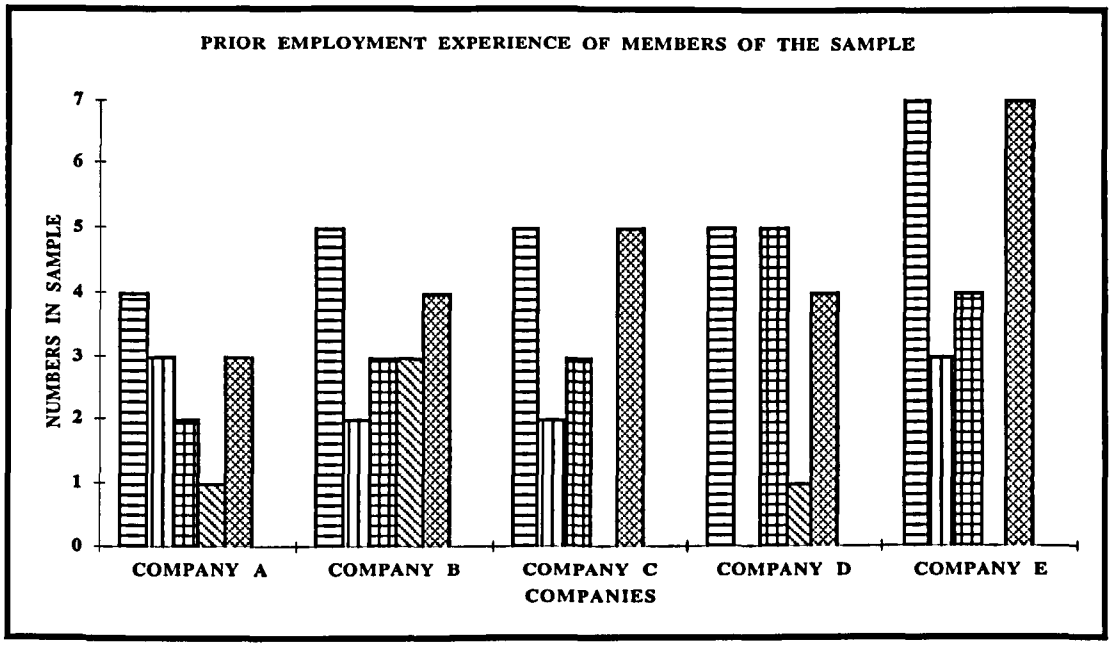


Key to Chart

5.1.7 Employment Before Joining Company

Members of the sample were asked to provide details of their previous employment to gain further insight into their interests and whether the organisations were recruiting generalists or specialists. Chart Six over page indicates the numbers in each company who had worked for another company before joining their present employer, whether their experience

Chart Six: Prior Employment Experience of Sample



Key to Chart

- Had worked elsewhere previously
- Had worked in a technical capacity before joining company
- Had acquired non-technical experience before joining the company
- Had worked for companies in the same sector previously
- Had worked outside the sector previously

was in a technical/non-technical field and whether they had previously worked in the same/different sector.

The results indicate that twenty-six members of the sample had worked for another company before joining their present employer. Of these, seventeen had held non-technical positions. The results suggest that there is a strong propensity to recruit externally and that those coming into organisations with previous experience will have worked outside

computing. However, there are significant differences between companies. Only two of the analysts at Company A, for example, had a non-technical background compared with five at Company D and three at Company B. The Chart also depicts the numbers in each company that had been recruited from the same sector or a different sector. A very large proportion of those who had prior experience had worked outside their current employer's sector. Of those who had not worked for another company before joining their present employer, data derived from the Career Development Questionnaire shows that just under half had only worked in other parts of the company in a non-technical environment, suggesting that the organisations have been keen to recruit users into the analyst's role.

5.2 The Role of the Analyst

This section describes the role of the analysts and provides an initial assessment of the impact of organisational change on their role over the last six years. To facilitate comparison between organisations, the analysts' responses were examined in terms of the following categories:

- *The tasks, duties and responsibilities associated with their role;*
- *The skills required to carry out their role;*
- *Previous role transitions within the organisation;*
- *Non-traditional role transitions;*
- *The extent of contact with users;*
- *Position and status of the systems analysts.*

5.2.1 Tasks, Duties and Responsibilities

The core of the analyst's role is the tasks, duties and responsibilities they perform. To place changes in the analysts' role into perspective, this sub-section describes their current tasks, duties and responsibilities. The information was gleened partly from the Career Development Questionnaire and partly from interviews with the analysts. Based on the BCS's outline description of hybrids it was assumed that, if the systems analyst's role were broadly defined or had a business focus, their tasks would involve helping users define their requirements, writing functional and technical specifications, outlining the design for systems and overseeing implementation (BCS, 1990).

The results indicate that no one in the sample is carrying out such a wide range of tasks. In practice, the organisations are dividing responsibility for the systems analysis job function between two occupational groups - business and systems analysts. Although there were no hard and fast boundaries between their roles, the business analysts tended to be responsible for gathering user requirements; writing feasibility studies and managing implementation. The role of the systems analysts was typically to turn the functional specification into a technical specification; to liaise with programmers and designers and to assist in installing the systems. All the analysts recognised these basic differences between the roles. At Company A, for example, one of the business analysts observed that:

> *There is a double team: one that actually runs the system and one that is composed of business analysts who go out and talk to the real users - the people who will get the reports at the end of the day and have to use them.*

and at Company E:

> *... the business analysts do most of the front-end work and get involved in implementations they don't get down to technical detail.*

These quotations suggest that the business analysts are involved at the beginning and end of the life cycle, leaving much of the more technically defined tasks to the systems analysts.

Although the systems analysts tended to be more involved in the technical aspects of systems development, the individual's rank in the organisation clearly influenced the balance of responsibilities. The higher the systems analyst's rank, the more likely it was they were involved in managing people and processes and the less likely it was that they would be involved in routine technical tasks. In describing their role, the senior and principle systems analysts in the sample tended to emphasise the importance of non-technical skills. Those lower in the hierachy emphasised the importance of technical skills and described their role in largely technical terms. At Company A, for example, one of the lower level systems analysts described his role as:

> *... closest to the machine operation of the area that we cover ... I deal with changes to the system that are required not from a user perspective but from a technical perspective.*

The analyst/programmers at Company D also emphasised the technical elements of their role:

> *I spend the bulk of my time writing technical specifications, design reports and discussion documents.*

> *At this point in time, my technical abilities are the main requirement. I could not do my job without substantial technical knowledge.*

Rank was also a factor determining the content of the business analyst's tasks, though, unlike the systems analysts, increasing seniority did not mean additional responsibility for people. As business analysts moved through the grades they tended to operate at a more senior level in the organisation and the focus of their role was more strategic.

Although increasing rank altered the balance of competences required, the tasks of the analysts at Companies A, C and E appeared to be more technically focused than at companies B and D. At Company A, for example, all the senior analysts continued to have a strong involvement in the technical aspects of design and development in spite of their team leading responsibilities. At Company C, four of those interviewed were working in areas that required specialised knowledge. One of the team leaders was working on legacy systems; another member of the sample at the Company had moved into a role that had recently been created but required a skill set that could not easily be transferred to other parts of the organisation. At Company E three of the systems analysts in the sample were involved in design, testing and implementation. Two had been "pigeon-holed" into particular areas - one because he had skills in testing; another because of his skills in installing systems.

In contrast, the tasks of the systems analysts at Companies B and D were more broad-based. The analyst/programmers at Company D, for example, had complete responsibility for systems in their business process. At Company B the analysts contributed to most phases of the life cycle:

> *I've worked right through the development life cycle in my last three projects ... feasibility, analysis, design, construction, testing. I've become a jack of all trades!*

However, none of the systems analysts felt that they were carrying out the same tasks as the business analysts.

The range of tasks and duties performed by the business analysts also varied between companies. At Company B, the business analysts could investigate any problem that required a business solution, worked in different parts of the organisation and liaised with senior managers in the business. The business analysts at the other companies only investigated problems which required an IT solution and had limited access to senior managers in the business areas. This was a particular source of frustration at Company E:

> *I have been disappointed in the role. I thought I would have more freedom in my contact with the business; that I would build stronger bonds and be more effective at a business level ...*

The results also indicate that business analysts who rise through the ranks in IS are often given more technically defined tasks to do. While users in the role would be defining requirements, they were frequently called on to solve technical problems. At Company D, for example, one of the business analysts bemoaned the fact that she was carrying out technical tasks whereas she should be "involved in process re-engineering". The reverse problem presented itself at Company B. Here, the business analysts were keen to increase the scope of their technical involvement in system development:

> *Business analysis does not just equal the initial phase of development ... there is a role for the business analyst throughout the development life cycle.*

Business analysts from a technical background were therefore keen to assume some of the tasks carried out by the systems analysts and the systems analysts were keen to carry out tasks which their colleagues the business analysts were responsible for. In reality there was some cross over between their roles but as will be shown later, this was discouraged in some of the companies.

Overall, the findings suggest that systems analysts in Companies A, C and E are carrying out more technically defined tasks than in companies B and D. The roles of the business analysts do have a stronger business focus than the systems analysts but, again, there are differences between companies in terms of the scope of their responsibilities.

5.2.2 Skills Profile

All the analysts were asked to state the skills they required to carry out their role to gauge the relative importance of technical and non-technical skills. If most of the sample, or most of the analysts in a particular company, believed that business skills were a key requirement, this may indicate that roles were broad based and business focused. If, on the other hand, most believed that technical skills were the main requirement, this would suggest that roles were technically defined.

In interviews analysts were asked to state which skills they thought were important. The following categories were suggested to the analysts: technical skills; management skills; communication skills; user skills; business skills; self-management skills and problem solving skills. A short definition of each was given to ensure that analysts did not confuse the terms [4].

Technical skills

The ability to use system development techniques such as data flow diagramming, data modelling, computer programming.

Management skills

The ability to plan, organise, control, monitor and evaluate the work of others; to lead, motivate delegate, communicate, resolve conflicts and to work effectively in teams.

Communication skills

The ability to write and speak clearly, e.g. produce reports for management, give formal presentations; conduct meetings; carry out interviews; establish good working relations with others.

User skills

The ability to deal effectively with users, e.g. ascertain user requirements; advise users on the feasibility of different technical options; keep users informed about progress on systems development; co-operate with users in developing systems.

Business skills

Business planning and forecasting; IS and business strategy formulation; financial and marketing techniques; competitive analysis; internal organisational analysis; environmental analysis.

Self-management skills

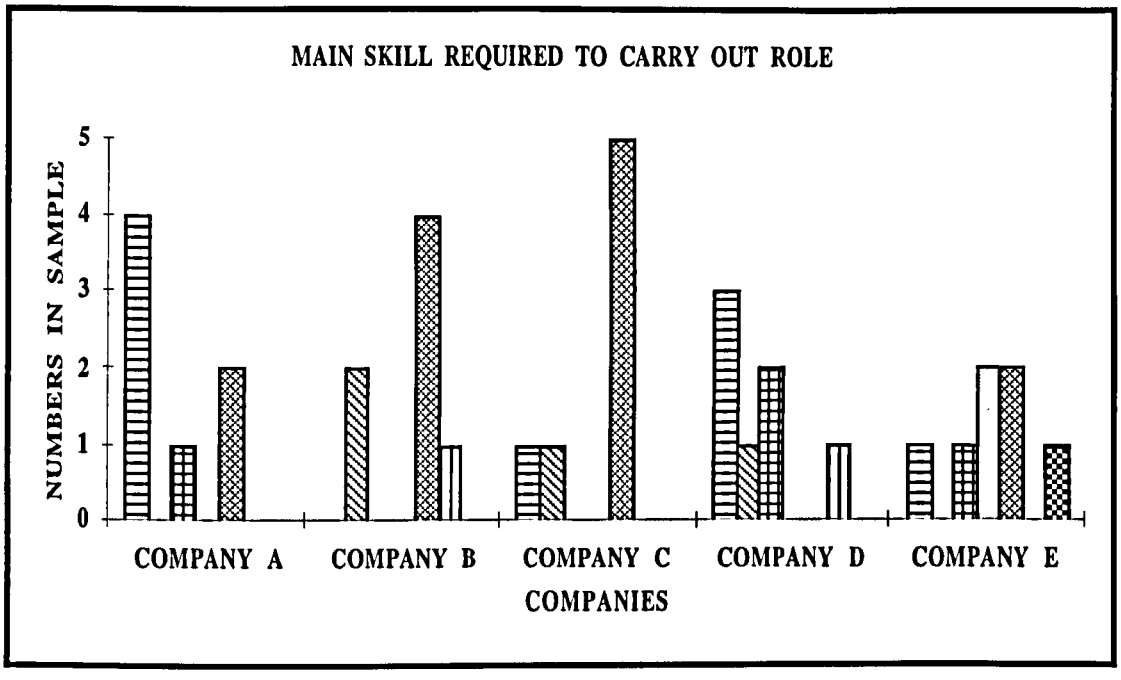
The ability to plan, organise, monitor and critically evaluate their own work.

Problem-solving skills

The ability to break a problem down into its component parts.

Chart Seven over page indicates the skill that the analysts rated as most important in carrying out their role in each of the companies. Communication skills are regarded as the key skill, with technical skills perceived to be just slightly less essential. The importance ascribed to communication skills is consistent with surveys published in the 1980's and suggests that analysts regard non-technical skills as critical to their role (Cheyney, Hale and Casper, 1989). However, there are interesting differences between the companies. At Company A, four of the analysts rated technical skills as most important whereas none mentioned technical skills at Company B. In the previous section it was suggested that the tasks of the analysts at Company A were technically focused - their perception of the skills required to carry out their role corroborates this. At Company B four of the analysts rated communication skills the most important requirement. Again, this is consistent with the analysts' account of their main tasks and duties.

Chart Seven: Main Skill Requirement of Role



Key to Chart

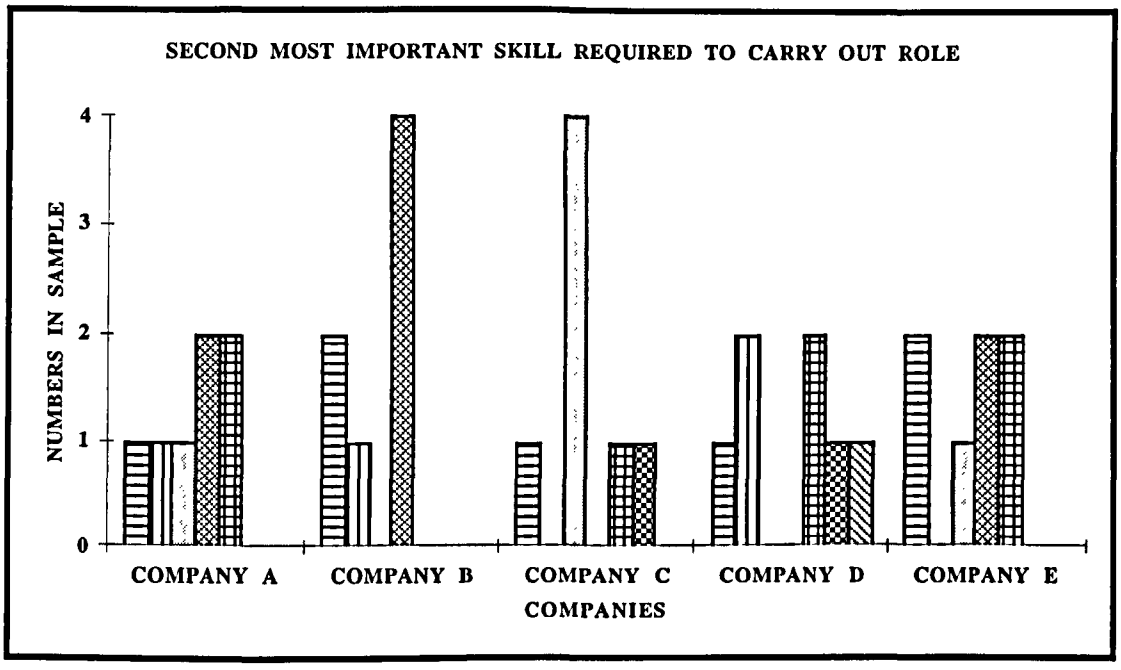
- Technical Skills
- Management Skills
- Communication Skills
- User Skills
- Business Skills
- Self-Management Skills
- Problem Solving Skills

At Company C, five of the analysts felt that communication skills was the key requirement. This finding seems rather surprising, given that over half of those sampled at the Company were carrying out work in technically specialised areas. In interviews, it became apparent that the importance ascribed to communication skills reflected the team leading responsibilities many of the analysts held. Although their role required quite a high level of technical knowledge in particular areas, they also needed to communicate effectively with team members and establish a good teamwork environment.

Perhaps the most interesting finding is the relatively low priority accorded to business skills. Although there had been a strong drive to increase business awareness in most of the companies, only four analysts felt that business skills was important in the execution of their role. It tended to be the business analysts/consultants who identified business skills as the key requirement. The same pattern repeated itself when the analysts were asked to identify the second most important skill in carrying out their role. Chart Eight over page depicts the skills regarded as second most important in carrying out their role.

Again, only four of the analysts felt that business skills was the second main skill they needed to carry out their role. The findings indicate that technical skills are considered important, though problem-solving skills are also rated quite highly.

Chart Eight: Second Most Important Skill Identified by Analysts



Key to Chart

- Technical Skills
- Business Skills
- Communication Skills
- Self-Management Skills
- Problem-Solving Skills
- User Skills
- Management Skills

Overall the findings suggest that the analysts regard both technical and non-technical skills as important in their role, though (a) there are differences between companies in terms of the relative importance ascribed to these skills and (b) business skills receive a low rating in all companies.

5.2.3 Previous Role Transitions

The findings so far indicate that roles of analysts are more technically defined at companies A, C and E than at companies B and D. To find out whether this had always been the case, or whether events in recent years had conspired to change the nature of the analyst's role, everyone was asked to provide details of their previous roles within the organisation and the tasks, duties and responsibilities associated with each. Data was collected partly from the Career Development Questionnaire and partly from interviews where the analysts were asked to describe their role and the changes that had taken place in it.

As almost all the analysts who had joined their company over five years ago had been promoted, most clearly felt that their role had become broader. However, closer examination of their job moves highlight some interesting differences between the companies. At Company A, for example, most of the analysts had held programming positions or gained programming experience as part of their role. One of the analysts explained that this was because the Company had always placed strong emphasis on the possession of technical skills:

> *... the company has never liked to take on systems analysts without programming experience. It's always been felt that analysts should understand how computers work.*

The data presented in Section 5.1.7 confirms this strong technical ethos. Only two of the analysts included as part of the sample had worked outside computing before joining the organisation. There is no evidence that this has changed in recent years. Three had joined the company five

years ago. None had worked in a non-technical environment; two were recruited straight into programming positions and had followed a traditional career path in computing

The situation was different at Company B and Company D. Although the average length of tenure at Company B was the same as at Company A, only two of the analysts had held programming positions. The need for technical competences has not increased in recent years. Two analysts had been recruited into the Company within the last five years, neither of whom had been appointed to a programming role or a role which had a strong technical content. When questioned, everyone felt that their role had broadened out over the last few years:

> *I have abandoned all programming and design aspects of computing. Although the methodology we're using requires a lot of technical knowledge, I'm becoming more involved in the business aspects of development.*

Although the majority of the sample at Company D had worked in a programming role, or had programming experience, data presented in Section 5.1.7 shows five had non-technical experience before they joined the Company. Of those who had joined in the last five years, all were recruited into analyst/programmer roles rather than straight programming jobs; those who joined before this time were trainee programmers. Most felt that their role had broadened as a result of changes in the organisation and not simply as a result of career progression:

> *I'm not just a code cutter ... My role has broadened out - technically, in terms of the responsibilities I have been given. I'm no longer working*

> *individually. I'm having to liaise with people all the time. I have become an expert in certain small areas.*

This quote highlights an issue which will be returned to later - the actual amount of the change. The analyst here was becoming proficient in "small areas". Even at companies where the analysts feel their role had broadened, it is apparent that there are constraints on development of the role.

At companies C and E the average length of tenure was five years and three years respectively, less than companies A and B. At neither Company had the analysts held any programming positions, though their role often entailed some programming. However, it appears from the analysts' accounts that most had tended, over time, to become specialised in certain systems or technologies. At Company C, for example, one of the analysts confessed:

> *I really only know my own area ... I've worked in this one small area all the time I have been here and now have a lot of knowledge about particular products.*

At Company E, the analysts had also tended to become specialised within one area or to have developed particular skills:

> *I have been earmarked as a testing person. The Company tends to pigeon-hole you into particular roles ... once you've shown you're good at doing something.*

For the business analysts at Company E, and for those at companies B and D the last few years had, of course, witnessed considerable change. The

business analyst role in these companies was, in each case, a product of the re-organisation so the analysts were moving into a new position. However, there were differences between the companies in terms of the analysts' perception of the extent of change. At companies B and D, the business analyst role had opened up new vistas. At Company E, the business analysts felt that their role had not changed significantly, or as much as they would have liked:

> *I can't see much difference between my role and a systems analyst's ... I know the other analysts, who have worked as business analysts elsewhere, feel they are being asked to do a system analyst's job.*

Those lower in the hierarchy tended to be less affected by organisational change than those higher up the ladder. Once again, however, there were differences between the companies. Those lower in the hierarchy at companies A, C and E, for example, reported less change in their role than analysts at companies B and D.

Overall, it would appear that roles at Company A have always had a strong technical content and this has not changed significantly in recent years. The systems analyst's role at Company B has traditionally been less technically defined and is becoming more broad based. At Company C and E, though management are seeking to create a more hybrid workforce, the analyst role has been, and remains, fairly specialised. At Company D the systems analyst's role has traditionally been technically defined but the policy has been to gradually increase the scope of the role. In all the companies, the results indicate that there are constraints on the extent of change in the analyst's role.

5.2.4 Non-Traditional Role Transitions

Another way of finding out whether the role of the analyst was broadly defined, or had become more broadly defined, was to ascertain whether any of the analysts had moved into the IS department/division from one of the business areas in the last five years or moved out of IS for a spell. If they had moved in either direction they would have had the opportunity to acquire a broader range of competences. The results indicate that no one in the sample had moved into IS of their own volition over the last five years. However, both Company C and Company D had brought in some of the business analysts from the business areas. At Company C the business consultant had recently moved into Group IS as part of a general move to bring the business analysts within the Company within the Group. At Company B the entire BA Section had been absorbed into the Development Section. Although users were being brought into the IS department/division, there appeared to be little, if any, movement out of it. No member of the sample, who had experience in IS, had spent a significant amount of time in the business areas.

The results suggest, therefore, that users moving into the IS department/division of the companies may be acquiring a range of technical competences but those with a technical background are not gaining significant exposure to the business. In interviews it was clear that the knowledge and experience of the business areas the analysts had gained tended to be through working on projects in user areas.

5.2.5 Contact with Users

If the systems analyst's role were broadly defined, the analysts would, presumably, enjoy frequent and direct contact with users in the business areas. It was important to ascertain, therefore, the extent of contact between analysts and users in the case study organisations.

The results indicate that there were significant practical obstacles to communication in that most of the users were located in the branch network, well away from central IS. To overcome this problem, the organisations had either designated user representatives to liaise on behalf of the business areas and/or included users on project teams. Thus, although it was difficult for the systems analysts to communicate directly with users who would actually use the system, there were "intermediaries" they could consult with.

The extent of contact with users and user representatives is much less than would be expected. Although users and systems analysts met on project teams and spoke on the 'phone, formal contact, particularly the requirements gathering, was usually via the business analysts. At Company D, for example, one of the business analysts observed that:

> *The most important thing I do is bridging the communication gap between technical specialists and users. I spend quite a bit of my time talking to both sides. I'm acting as a translator between the two.*

However, the systems analysts were being encouraged to exercise more initiative in contacting users. This was viewed by the analysts as one of the most positive outcomes of the organisational restructuring:

> *Before the re-organisation, my manager would have done most of the liaison with the users ... now I'm the one who's going around talking to them!*

Similarly, at Company B, though the business analysts had most dealings with users, the analysts were encouraged to contact users directly.

This was not the case at companies A and C. Here, all communication was supposed to be via the business analysts and management were keen to maintain this division of responsibilities. The analysts deeply resented this and believed it to be a major cause of project delays:

> *We get the documentation from the business analysts and then have to phone the client directly to make sure its right and then go back to the business analyst who then gets in touch with the client and so it goes on ... It is time consuming, costly, tedious and causes a lot of errors.*

This quote indicates that the systems analysts were circumventing the business analysts. This was happening in all the companies to a greater or lesser extent. Although it meant that they had, in effect, "reclaimed" some lost territory, most did not feel that they had management approval.

Overall, the results suggest that there are constraints on contact with users. All the companies were using business analysts to act as go-betweens. However, two of the companies - B and D - were keen to encourage more direct contact. This appeared to be one of the consequences of the restructuring that had taken place in the organisation.

5.2.6 Position and Status

Given that the role of the systems analyst appears to be technically defined in three of the case study organisations, the question arises of whether this has in any way affected their status. If they are perceived to occupy a less important position than the business analysts, this may influence the way their role is defined and the scope for change in it.

Before answering the above question, a distinction needs to be drawn between the objective and subjective status of the two groups. Objective status refers to whether one group is paid more than other, receives additional benefits, has better career prospects, etc. Subjective status exists in the eyes of the parties concerned - how management view the groups, how the groups view each other.

In terms of the former, there were objective differences in the status of the two groups. At Company E, for example, the business analysts were on a much higher salary scale than the systems analysts. At Company D they were on a lower salary scale but only until they had acquired certain prescribed technical competences. In all organisations, the business analysts were on a different career ladder from the systems analysts (though this did not mean that the system analysts could not move across).

With regard to their subjective status, in all the organisations that had included a business analyst in the sample, the business analysts believed that they occupied a higher status. This was largely because of the prejudice which existed against technical professionals. The reason for appointing business analysts was that the systems analysts were perceived

to have poor communication and business skills. At Company D, one of the business analysts observed that:

> *The business analyst role here grew out of dissatisfaction with the systems analyst's role in the same way that the systems analyst's grew out of dissatisfaction with the ability of programmers to undertake systems work.*

The low status in which technical professionals were held made it difficult for the business analysts who had risen through the ranks in IS to establish credibility with users.

> *... you have to work incredibly hard at getting the users to trust you ... they have had bad experiences of IT and are wary of getting their fingers burned.*

These attitudes were reflected in the comments of management. At Company E, for example, one of the managers felt that systems analysts had difficulty establishing good links with users in the business areas because "they don't speak their language". It was to remedy this problem that the Company decided to appoint the business analysts two years ago. However, the two included in the sample from a technical background found it difficult to gain acceptance in the business areas.

Although the business analysts were perceived to occupy a higher status, this did not mean that the systems analysts necessarily thought they were superior. The systems analysts' criticisms highlight some of the potential obstacles to creating change in their role and the business analyst's. A key criticism was that the business analysts lacked sufficient understanding of technology to carry out their role effectively. This was not compensated for by their understanding of the users' business requirements. Most of

the systems analysts believed that the business analysts were too far removed from users in the business areas to understand their actual requirements.

Only at Company B did the systems analysts appear to have a high regard for the business analysts. Here, the fact that they investigated any business problem (not just IS related problems) earned the respect of the systems analysts. Although the business analysts' wide experience of the business might make them a potential threat, the decision to bring the BA Section within the Development Section and to "seed" their expertise had, in the eyes of the analysts, altered the balance of power. The systems analysts at Company B therefore felt themselves to be in a strong position.

At Company D and E where the business analysts were clearly being treated differently by management, the systems analysts did not feel so secure. Because the intention was to "beef up" the business analyst's technical skills at Company D there was a feeling that the systems analyst may one day "disappear". At Company E, the strong management support for the business analysts had also generated uncertainty about the systems analyst's future status.

To conclude, the findings indicate that the business analyst occupies a superior status in all the case study organisations. In two of the organisations, D and E, they are clearly "rising stars". Although the systems analysts at companies A and B feel secure in their position, in all the case study organisations the business analysts have appropriated tasks and responsibilities that were once part of the systems analyst's job description. The business analysts' "success" appears to be due, at least in part, to management's perception that systems analysts lacked the

competences necessary to deal effectively with users and the business aspects of their role.

5.3. The Analysts' Orientation to their Role

So far a picture has emerged of the systems analyst's role having become more technically defined or specialised in three of the case study organisations. Although this suggests that organisational factors play a significant part in shaping roles, the individual's attitudes and actions are also important. In Chapter One and Two it was suggested that individual and organisational factors usually combine to influence the scope for change in roles.

This section therefore examines the analysts' orientation to their role. Research described in Chapter One tends to suggest that IS professionals have a strong technical orientation (Mumford, 1972; Lyons, 1985). If most of those included in the sample were primarily interested in the technical aspects of their work, this may influence the scope for "hybridisation". If, on the other hand, the main source of interest lay with the business or managing people, this would presumably make it easier to develop hybrids. The analysts' orientation to their role was ascertained by asking whether they defined themselves as a computer professional, a hybrid, etc., the main sources of satisfaction in their role and their career goals.

It was also important to determine how much control the analysts felt they could exert over their role. Clearly, if all the analysts had attempted to define their role very broadly, the finding that roles are technically defined in three of the organisations suggests that the individual's ability to influence their role may be quite limited. The final part of the section

examines whether gender or age issues made any difference to the analysts' interpretation of their role.

5.3.1 *The Analysts' Self-Perception*

The results indicate that most of the systems analysts do see themselves as computer professionals. There were differences between the companies, however, in terms of the relative importance attached to technical expertise. At Company A, where the analysts rated technical skills as the key requirement, most had a strong technical orientation. One described himself as "an artist *whose medium is documentation*". Another commented that:

> *I have always had a logical mind. I've never been particularly happy tackling managerial problems. I much prefer the challenge of programming. I sometimes get high on it!*

Only the business analyst, who had previously been a systems analyst, did not have a strong technical orientation:

> *I'm not turned on to computing at all. I don't find it exciting. It's people who excite me - turning negative people into positive people.*

The business analysts at Company B also had a strong interest in people and in helping users:

> *I enjoy talking to the users and helping them define their problems. I do have a technical background and you certainly need an awareness of technology to do the job but the important thing is being able to communicate with the users in a language that they understand.*

Although the systems analysts at Company B enjoyed the technical challenge of their work, they appeared to have a stronger business and customer focus than the systems analysts at Company A. One of the oldest and most technically skilled members of the sample described himself in the following terms:

> *I see myself as a computer person who tries to find out what the business requirements are and then translates this into a technical requirement.*

Another observed that he was:

> *... a hybrid analyst ... very much on the user end. I can go down to a reasonable amount of detail on design .. but I'm not a brilliant programmer. Programming is something I have never really done.*

At Company C, a difference in perception emerged between those responsible for managing teams and those whose main responsibility was design and development. The managers tended to express a stronger interest in the business. Overall, however, the analysts defined themselves in technical terms:

> *I enjoy the technical side of my work ... On balance, I think I fit more on the technical than the managerial side.*

At Company D where management was most explicit in its intention of creating a hybrid workforce, four of those interviewed defined themselves as a computer professional. Only the project leaders felt that they were "becoming hybrid managers". The business analysts at Company E also

described themselves as embryonic "hybrids". In contrast, the systems analysts tended to define themselves as computer professionals:

> *I do have managerial skills and experience but I don't see myself as a management person. The managerial roles at this company have a strong political factor in them. I'm not at all interested in politics.*

The distate for organisational politics highlighted in this quotation was a recurrent theme in many of the interviews.

5.3.2 *Sources of Satisfaction with the Role*

Further evidence of the analysts' orientation to their role was obtained by examining the factors that were a source of satisfaction in their work. In interviews they were asked to identify those aspects of their work that provided them with the greatest satisfaction. Statements were then content analysed and from this it was possible to derive sets of factors that were a source of satisfaction. These were related to the social environment, the organisational environment, the business environment and the task environment. Each of these "environments" is described briefly below:

<u>Social environment</u>

This category describes the analysts' relationships with their peers. A good social environment was usually one where analysts felt that they were able to eatablish good working relationships, there were opportunities to mix informally during work hours, a good team spirit prevailed, etc.

Organisational environment.

This category covers pay and conditions of employment and the analysts' relationship with management. A good organisational environment was one where analysts felt they were paid at or above the market rate for the job, there were opportunities for promotion, they were involved in decision-making, consulted about changes and generally respected by management.

Business environment.

This category covers relationships with managers or users in the business areas. The business environment was a source of satisfaction where analysts felt that they had a good relationship with business managers and users and where it was perceived that the business had a positive attitude towards the IS department/division.

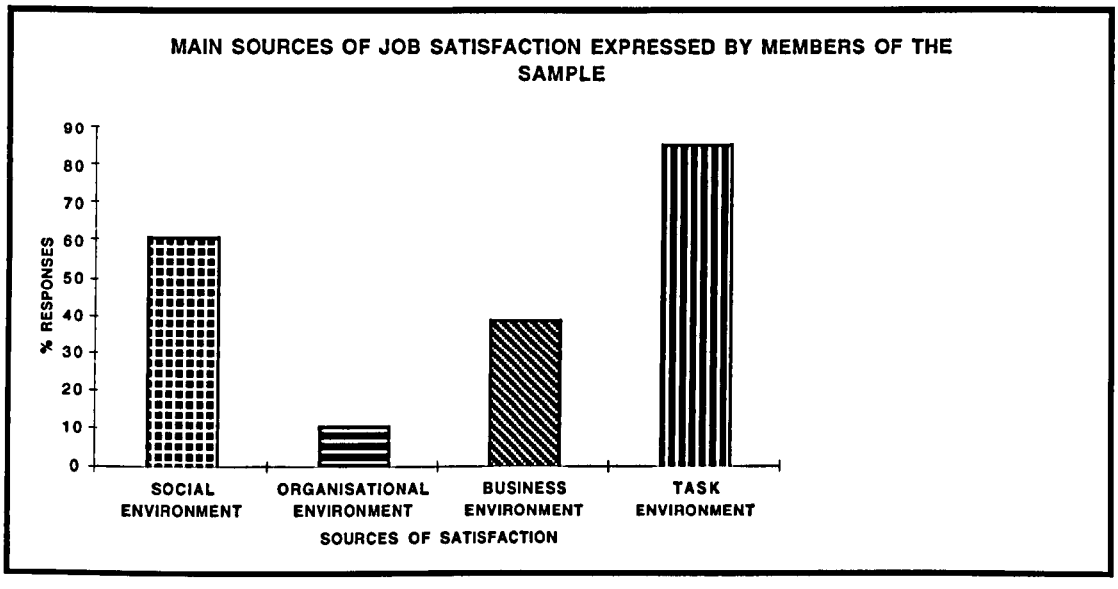
Task environment

This category refers to the nature of the work itself. Analysts expressed satisfaction with the task environment if they found the work technically challenging, varied and if they were given discretion over their tasks.

Given that most of the systems analysts defined themselves as computer professionals, it might be expected that they would regard the technical challenge of the work as the key source of satisfaction. The results confirm the importance of having technically challenging tasks to perform, but it is the general nature of the work, including task variety and control over work, that are the key sources of satisfaction. Chart Nine provides a breakdown of the main sources of satisfaction expressed by the analysts in terms of four main categories specified: the social

environment, the organisational environment, the business environment and the task environment.

Chart Nine: Analysis of Satisfactions



Factors relating to the task environment are far more important to members of the sample than their relations either with the business areas or with colleagues, although these results suggest that the sample has a stronger need for affiliation than Cougar and Zawacki's research suggests (Cougar and Zawacki, 1980; Zawacki, 1992). When the sources of satisfaction are broken down by company, differences do emerge in terms of the general sources of satisfaction. The business environment is a much greater source of satisfaction at Company B and Company E than elsewhere. The task environment is also rated highest at Company B suggesting a fairly high degree of satisfaction with the nature of the work. Overall, the results would appear to confirm that the analysts are strongly motivated by the work itself, particularly the technical challenges and the variety it affords. This is true of the business analysts as well as the systems analysts but the business analysts tended to mention delivering

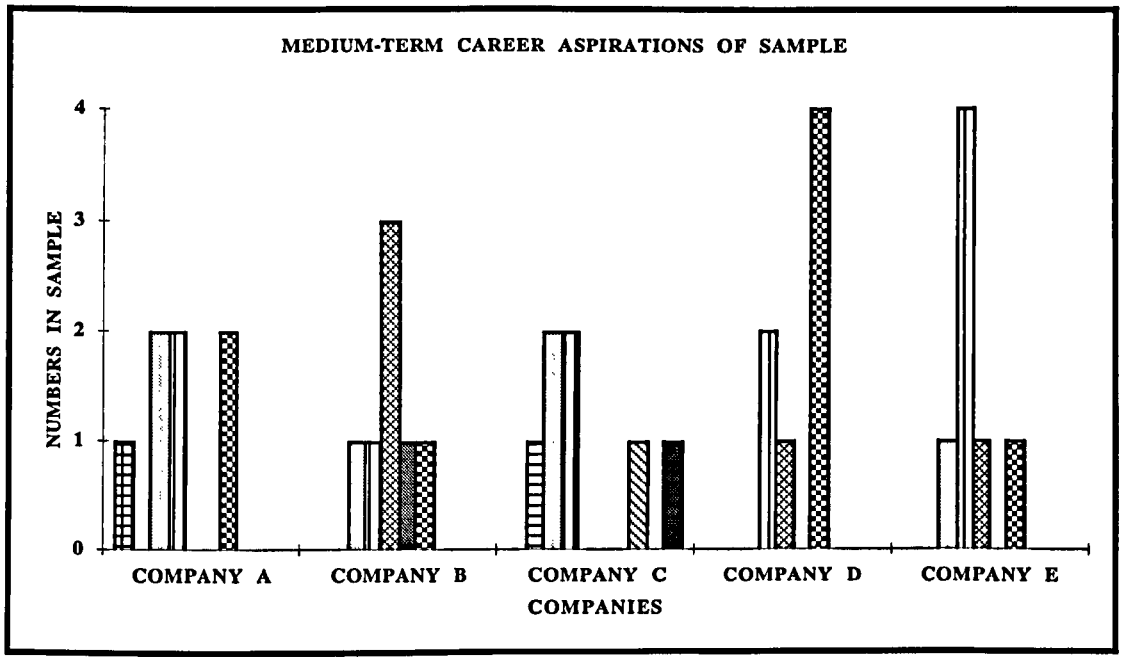
systems that benefit the business as a source of job satisfaction more frequently than the systems analysts.

5.3.3 Career Goals

On the Career Development Questionnaire everyone was asked to state their career ambitions. If everyone in the sample was keen to pursue a career in management or to develop their career in the business areas, this may be evidence of a management/business orientation to their role. The results are displayed in Chart Ten over page.

The Chart indicates that nineteen of the sample are interested in pursuing a career in management; eigth want to be business consultants and only one person aspired to be a technical specialist. Although this suggests that most of the analysts have a fairly strong management orientation, closer analysis of the Chart reveals a slightly different picture. Of those opting for a management career, eleven wanted to be technical managers: only two said that they would like to be general managers. There are also differences between the organisations in terms of the type of career preferred. Five of the analysts at Company C wanted to be either a technical specialist, a technical consultant or a technical manager: at Company B only two people mentioned a career as a technical manager or consultant. At Company D, four of the analysts stated that they would like to become a business consultant compared with just one at Company E.

Chart Ten: Medium Term Career Aspirations



Key to Chart

	Technical Specialist		Project Manager
	Technical Manager		Senior Manager
	Business Consultant		Technical Consultant
	General Manager		Sen An/Programmer

When interviewed about their career preferences, most of the analysts confirmed that they would be following a management path in IS. However, there were strong organisational incentives to do so. Many stated that they had been put off following a technical career path because the rewards were higher for those on the management path. At Company D, one of the analysts commented that:

> *I am interested in the technical side of things but you can't get as far on the technical route ... the rewards aren't as great.*

Another observed that:

> *The organisation lacks a viable career path for technical specialists. People are put off a technical career because you don't get the same benefits.*

5.3.4 Analysts' Control Over their Role

In Chapters One and Two it was suggested that IS professionals will seek to exert control over their role and define it in ways that are consistent with their background, interests, objectives, etc. The findings indicate that the analysts did exercise a certain amount of control over their role. Those who were more interested in the technical side had clearly shaped their role in ways that allowed them to use their technical skills. At Company A one of the analysts commented that:

> *I do enjoy the technical side of the job - getting my hands dirty. Although I am team leading I still do a lot of the technical work ... .*

It will be recalled that the analysts rated the task environment as the most satisfying aspect of their work. In spite of the difficulties experienced in contacting users directly, the work itself is something the analysts did feel they had control over and clearly enjoyed.

It was in the area of career development, however, that the analysts displayed most initiative in managing their role. Those who were interested in a career in management had attempted to overcome the constraints imposed by the system, i.e. shortage of jobs, lack of opportunities to demonstrate management potential, in a variety of ways. At Company C one of the analysts was so frustrated at the lack of

opportunities to meet managers who might help his career he had manoeuvered himself into a position where he came into contact with senior management in a social capacity at least once a year! At other companies analysts who recognised the importance of "visibility" in securing career advancement had either persuaded project managers to allow them to work on high profile projects or ensured their name appeared on documents that would be seen by management.

The difficulty the analyst at Company C experienced gaining access to management highlights some of the constraints on individual action and helps to explain the finding that the analysts found the organisational environment the least satisfying aspect of their work. In all the case study organisations there were considerable constraints on the scope for individual action. This was partly because they worked in large organisations that were quite functionally specialised and partly because management maintained a fairly high degree of control. Thus, while management frequently spoke of the need for empowerment in bringing about change, most of the analysts did not feel that they were sufficiently empowered to make real changes. The comment of one of the analysts at Company D that she was becoming an expert in "small areas" indicates that the amount of actual change was often quite small. The longer the role had been established, and the more fixed the expectations surrounding it had become, the harder it was to change and the less control the individual felt they possessed.

5.3.5 Gender and Age Differences

With regard to gender, the findings suggest that the females in the sample tended to be more proactive in managing their role and career. This is

because they believed that the only way to get ahead in a male dominated environment was by being assertive. The fact that the females tended to occupy the higher status positions lends support to this idea. One of the female members of the sample described how, having been given fairly menial tasks to do, she requested an interview with her manager and succeeded in persuading him to give her "meatier" tasks. Another had pestered her manager to give her more people management responsibilities because this was an aspect of the job she enjoyed and was also likely to advance her career in management. All the women in the sample felt that there were constraints on what they could achieve, however, and were highly critical of company policies that failed to exploit the talents of individuals.

Age also emerged as a factor influencing attitudes and behaviour. Those in the sample who were aged over forty were clearly worried that they may be made redundant as a result of organisational change. While they believed that that they would be able to obtain another job, the fear of redundancy was one of the factors that led them to emphasise the technical aspects of their job. They perceived that other organisations would be far more interested in their technical skills than in their management ability.

> *I'm over forty now and have been made redundant before. I'm worried about gaining more management experience because I think that what employers look for is technical skills. I don't want to lose my technical currency.*

Thus, both the external labour market (the continuining high demand for technical skills) and management policy (retiring employees at a younger age) had conspired to create the impression that job security rested more

on technical than on management ability. The fact that the organisations tended to reward management competences more than technical competences was irrelevant because it was the "middle managers" who were perceived to be most at risk from redundancy.

5.4 Sectoral Influences

One final point concerns the question of whether there were differences in the analyst's role that could be attributed to differences between the sectors. The evidence suggests that there are differences which, as predicted in Chapter Four, relate to the type of systems used and the culture of the sector in which the organisation operates. Thus, in terms of the content of roles analysts in the retail sectors needed to be conversant with the retailing business and were working on more modern systems. They identified the latter as a major source of satisfaction and useful to their career development. The analysts in the finance sector were working on financial applications and tended to be using older systems. Having to support older systems was a major source of dissatisfaction and was regarded by the analysts as a cause of turnover. The culture of the sectors also appeared to make a difference. Retailing has always been a very fast-paced business and this was reflected in the analysts' comments about the environment in which they worked. Financial services has traditionally been slower paced and this too was reflected in the analysts' comments.

Although the core business of retail and finance companies is different, this does not appear to have exerted a significant impact on roles. The analyst's role might be expected to be more specialised in financial companies as they have, historically, tended to be highly bureaucratic organisations [5]. The organisation that had made most progress in

hybridising the analyst's role, however, was a financial service organisation, Company B. The reason there appears to be few differences based on sector, could be that the structure and operation of the companies were very similar. Also, as suggested in Chapter Four, the boundaries between finance and retail are becoming more blurred. Retail and financial service organisations are both operating in a market where they need to "sell" their goods to the customers so the forces driving change in the analyst's role are likely to be very similar. The convergence between retail and financial service companies was something managers in both sectors commented on in interviews when they discussed business issues. All considered it to be a force for change.

5.5 Summary

The foregoing analysis suggests that, in all the companies that took part in the investigation, the systems analysis job function has been split up and is being carried out by two main groups, business analysts and "systems" analysts, each of which make a different input to the development process. The business analysts are typically responsible for defining user requirements, writing the functional specification and managing the implementation process. The systems analysts are further down the chain. They are more involved in modelling the data requirements, writing the technical specification and installing or implementing systems. The main effect of subdividing the systems analysis function in this way has been to reduce the scope of the systems analyst's role. Over a period longer than the time frame for this research, the systems analysts have become less involved in the early stages of systems development and more involved in the middle and end stages.

Although the roles of the systems analysts tend to be technically defined, there were significant differences between the organisations in terms of the nature and scope of the latter's role. At companies B and D, the systems analyst's role was more broadly defined than at companies A, C and E. At Company B the systems analysts had greater involvement in the different phases of the life cycle and were moved around projects to broaden their skills base and knowledge of the organisation. At Company D the analysts were being encouraged to develop a sufficiently wide range of skills to enable them to assume complete responsibility for the systems in the business process to which they had been assigned.

The Chapter examined the extent to which individuals can exert control over their role and concluded that while they are able to control elements of the task environment, there are often powerful constraints on the scope for role innovation and career development. Gender and age differences were shown to influence the analysts' orientation to their role. The prejudice female members of the sample believed existed towards women made them assertive and proactive in managing their role. Increasing age was linked with increasing job security and was a factor reinforcing a strong technical orientation. The final part of the Chapter examined whether sectoral differences exerted any influence on the analyst's role and concluded that while differences in terms of the type of systems used and the culture of the sectors were important factors, the differences between the sectors were not as great as may be expected because of the similar operating structures of the organisations and the blurring of sectoral boundaries in recent years.

END NOTES

1. Statistics supplied by the Emploment Information Unit of the Employment Service, Department for Education and Employment points to regional variations in unemployment rates in the North and South of England. Unemploment in the South East and London in July 1995, for example, was 7.9% compared with 9.5% in the North and North West.

2. The survey covered 35,000 people in 500 companies.

3. Beck and Steel (1989, p.42-43), for example make the observation that:

> *... Women create their own barriers. Much of this can be attributed to a general lack of confidence which inhibits them from developing goals of advancement. Women are less likely to identify their potential and push themselves forward for training or promotion. They are less likely to express their needs or be assertive in their dealings in the workplace.*

4. The skills categories were derived from reading a number of different sources. These are as follows: Technical Skills (Mason and Willcocks, 1994); Management Skills (Adair, 1986; Rees, 1991); Communication Skills (Adair, 1973; Katz, 1989); User Skills (Mason and Willcocks, 1994); Business Skills (Thomas, 1983; Luffman et al, 1991); Self-Management Skills (Mulligan, 1991; O'Reilly, 1993); Problem-Solving Skills (Pokras, 1989; Raybould and Minter, 1991).

5. See Revell (1973).

CHAPTER SIX

Forces For and Against Hybridisation in the Analyst's Role

6.0 Outline of the Chapter

In the last Chapter it was suggested that the roles of the systems analysts had become more technically defined or specialised in companies A, C and E and that they had become more broad based in companies B and D. This Chapter seeks to account for these differences and examines why, even in companies where roles have become broader, there are still constraints on "hybridisation". To develop a clearer understanding of the problem, the Chapter uses the Model of Forces Driving and Constraining Hybridisation in the Role of the Systems Analyst presented in Chapter Two. This identified a number of forces pushing organisations in the direction of "hybridising" the systems analyst's role and a number of forces pulling them in the opposite direction.

The Chapter will show that the forces for hybridisation have been greater than the forces for specialisation in companies B and D and that both these organisations are moving from defining the systems analyst's role in technical terms to business terms. In all the other organisations, the type of technology the company uses, the structure and culture of the organisation and the IS department/division, existing divisions of labour, the activities of various groups and the analysts' own interests and abilities continue to define the role in technical/specialised terms.

6.1 Forces for Change in the Outer Context

In Chapter Two it was suggested that changes in the outer context may, indirectly, influence the degree of hybridisation through their impact on organisational structure and functioning. Thus, general changes in the political, economic, social and technical environment, increased competition, etc. may all create pressures which drive organisations in the direction of changing their structure in ways that lead to roles becoming broader and more business-focused. The analysis of the external drivers of change in Chapter Four confirms that there have been powerful forces for change in the case study organisations in the last decade or so and that these may be a force for hybridisation. Increased competition, changes in the pattern of demand, etc. have all placed pressure on organisations to move to a flatter structure, to reduce layers of management and to use technology to create competitive advantage. The effect of these changes may be to push organisations in the direction of hybridising the analyst's role.

The analysis of the roles presented in Chapter Five suggests, however, that the impact of these forces for hybridisation varied according to the context. Thus, while all the organisations responded to macro-environmental and sectoral pressures by reducing staff, delayering, introducing new technology, the roles of the analysts had not become broader in all the companies. Roles remained technically defined in companies A, C and E. Forces in the outer context may have contributed to this, of course. All these companied had suffered in the last ten years as a result of increased competition, particularly companies A and E which were on the point of collapse when a new management team took over. The comparatively higher levels of specialisation in roles may therefore be a reflection of the

problems brought about by increased competition. This argument is difficult to sustain. Although increased competition had certainly aggravated the companies' problems, it is clear from an analysis of their histories that companies A and E had been plagued by problems of poor management for many years. Differences between the organisations is more a reflection of the way they responded to external pressures for change than the growth of competition per se.

In Chapter One it was suggested that a change in management or the status of an organisation may be a force for change in roles. The question arises of the extent to which this was a force for change at companies A and E. If the change diminished the control exercised by existing management and encouraged the sharing of resources, knowledge and expertise, this might be a significant force for hybridisation. If it perpetuated existing practices, the change may be a force for specialisation. The results indicate that in neither case was the change in status/management a force for hybridisation. In Company A's case, particularly, it encouraged specialisation in that (a) the culture of the new management favoured specialisation and (b) the type of technology which was being introduced into the Company limited the scope for development. It will be several more years, of course, before the impact of management changes will become fully apparent.

In Chapters One of Two it was observed that outsourcing could be a force for or against hybridisation. Management at the companies discussed outsourcing in interviews in terms of the business problems facing the organisation. The findings from these interviews and analysts' comments about changes in their role suggest that, although none of the companies had conceded much responsibility for their IT resources to third parties,

what steps they had taken had generally been a force for hybridisation in roles. Companies B, C, D and E had outsourced routine tasks such as programming. Companies B and D had also sub-contracted work that required skills in specialist areas where there was no long-term benefit in training in-house staff. The analysts at the companies stated that this had freed them to concentrate on analysis and meant that they could become involved in a wider range of activities. Management at Company A was strongly aversed to outsourcing and employed programmers to carry out most of the coding. This finding is consistent with other data which suggests that the Company is keen to cultivate analysts with specialist skills.

The external labour market was identified as a factor that could influence the degree of hybridisation in roles through its impact on human resources strategy. The labour market may be a force for hybridisation if there is a plentiful supply of people with a balance of technical and non-technical skills or if skills shortages forced the organisations to recruit internally. The data presented in Chapter Five suggests that the organisations were keen to recruit people from a non-technical background. Seventeen members of the sample had worked in a non-technical position before joining the Company. Although the sample size was small, the fact that they recruited IS professionals from a broad background is significant. As regards internal recruitment, only Company E had not recruited some staff internally. The decision to recruit internally does not appear to have been a result of skills shortages, in the last few years anyway. When the issue of skill shortages was discussed with managers, it was clear that they saw it as a means of injecting business expertise into IT.

It was suggested in Chapters One and Two that changes in the education system might be a force for hybridisation in that more graduates would be coming on to the labour market with hybrid qualifications. The findings indicate, however, that only one member of the sample had a hybrid degree (Business and Engineering). Although the introduction of courses that combine Business and Computing was cited as a force for hybridisation in Chapter Two, in interviews, managers had either not heard of such courses or did not feel that they offered any particular advantages.

One other force for/against hybridisation mentioned in Chapters One and Two was the professional bodies and trade unions. It was suggested that the professional bodies had done much to promote the hybrid manager concept in the early 1990's. The fact that all the companies were familiar with the hybrid manager concept and Company D was quite explicit in its intention of creating a hybrid workforce seems to suggest that the BCS does exert an influence on management thinking. However, in interviews it was clear that both managers and analysts were more influenced, in practice, by media coverage of the hybrid issue and their knowledge of what was happening in other organisations. The general perception was that the professional bodies were too far removed from the day-to-day activities of organisations to exert much direct influence on organisational structure or roles. The influence of the other external body mentioned, trade unions, was discussed in terms of general changes within the organisation. The results indicate that the analysts were not actively involved in trade unions mainly because they felt confident about their employment prospects.

6.2 Forces for Hybridisation in the Inner Context

One of the key forces driving organisations in the direction of hybridising roles, according to the Model presented in Chapter Two, is change in corporate strategy. All the case study organisations had experienced significant changes in corporate strategy over the last six years and this, combined with internal pressures, had influenced their strategies for managing IS. To the extent that these changes had resulted in the companies introducing new systems that gave analysts the opportunities to work with new technologies and increased user control of IT, it could be argued that changes in strategy were a force for hybridisation in most of the companies.

Both the retail organisations had invested heavily in new technology over the last few years and the analysts clearly felt that this had created exciting development opportunities. Although there was less new development in the financial service companies the analysts at Company B were being trained in the use of a new software tool that would enable users to develop their own applications. The effect of these changes in each case was to give the analysts the opportunity to acquire a broader range of technical and non-technical skills.

Changes in human resource strategy were another force for hybridisation identified in the Model presented in Chapter Two. All the companies had introduced some new policies to support organisational change though, as suggested previously, the extent of change varied considerably. Companies B, C and D had introduced the most radical changes - the creation of resource pools, the appointment of resource managers, the move to role profiling, etc. These changes were designed to broaden the

roles of staff and were viewed by the analysts as part of a general culture change.

Another force for hybridisation identified in the Model was the introduction of new approaches to systems development. It was suggested in Chapter Two that the introduction of Prototying, Rapid Application Development, etc. would be a factor pushing organisations in the direction of hybridising the analyst's role since they require analysts and users to work together more closely. In two of the companies, the introduction of new approaches to development was perceived to be a force for hybridisation. Company D had recently introduced a new approach to project management, based on the development life cycle, but which required IS professionals to meet regularly with users to present "deliverables". Company E was introducing RAD methods to expedite the development process. This approach to systems development was regarded as a force for hybridisation by both analysts and managers because it called for multi-skilled developers rather than IT specialists. However, RAD was confined to small projects and was still being used experimentally so its actual impact on roles was quite limited.

The supply of labour was a further force for hybridisation identified in the Model. As suggested in 6.1. some of the companies had altered the balance of skills in IS by recruiting people who had worked outside computing or had experience of working in a different sector. This was particularly noticeable at companies D and E, where over half the analysts had some non-technical experience before they joined their present employer. Company E was especially keen to recruit outside the retailing industry people with the right "functional" experience on grounds that they would have a different perspective to offer. This obviously had quite a strong

psychological impact in that all the analysts mentioned that many of the business analysts had been recruited from other companies. However, recruiting from "outside'" created the impression that it was difficult to become a successful business analyst without this background. So, while the business analysts might introduce hybrid competences the use of outside expertise suggested that the Company was not developing its own.

Changes in organisational structure were also identified as a force for hybridisation in the Model. All but one of the organisations that took part in the study had "downsized", reducing headcount by several thousand. However, *company-wide changes in structure* was the major force for hybridisation only at Company D. Here, the entire organisation had been "process re-engineered". The scale of the changes had heightened analysts' awareness of change and raised expectations within the business and IT.

> *The change programme had a tremendous psychological impact on everybody .. it raised expectations both in the business and in IT.*
>
> *The change programme wasn't a one off thing. It's a way of life ... a complete culture change. We must keep on ... we have to keep moving forward.*

Changes in the structure of the IS department/division were a potential force for hybridisation at companies B, C and D. At Company B the Development Section had been restructured into Resource Pools; at Company C management had divided the Delivery Section into "Towers" facing out to the business; at Company D the old IT Division was completely restructured as part of process re-engineering within the business. The scale of these changes had heightened awareness of change and were a force for hybridisation at companies B and D but not at Company C. At Company C, there were a number of factors which

constrained the impact of the major structural changes that were introduced. At companies A and E, where management had introduced far fewer changes in the analyst's immediate environment, the impact of organisational change was not felt so keenly. One of the analysts at Company A, for example, observed that:

> *There have been a lot of changes in the company over the last few years ... but we haven't felt the impact here ... we are still working in the same department and the same project teams ... there's less money about, though!*

Another structural change that was a force for hybridisation was the devolution of responsibility for IT to the business areas. All the organisations, except Company A were keen to devolve more responsibility to users. This was a strong force for hybridisation at Company D where most of the analysts strongly supported the decision to give greater responsibility for IT to the business processes. Here, one of the business analysts who had worked in the old IT Division before it had been dismantled, and had a strong technical background, remarked that:

> *My loyalties lie with the business. I do see it as my role to lobby on behalf of the business. There are genuine criticisms of IT I would accept.*

Most of the systems analysts at Company D also identified quite strongly with users, though none wished to move into the business process permanently or to assume a position outside IS.

Changes in the structure are often accompanied by changes in culture. The latter was identified as an important force for hybridisation in the Model presented in Chapter Two. Management confirmed that a key objective of

the changes at companies B and D was to create a more flexible, business-oriented culture within the organisation generally. This had met with some success. At Company D, for example, one of the analysts observed that:

> *The whole culture has changed. It used to be very regimented and bureaucratic ... Changes in the business environment have forced managers to change ... the culture is a lot livelier now. Creativity is important. They're crying out for good ideas.*

These general changes in the culture of the organisation had influenced the culture in IS. At Company D, this had resulted in a much stronger emphasis on serving the needs of the client:

> *We spend more of our time worrying about whether we are customer-facing and delivering products on time ... we are less technically oriented than we used to be, though it will take a long time for that mind-set to disappear.*

The last part of this quotation suggests that even in companies that have managed to change aspects of the culture, there is recognition that it is often a slow and difficult process.

Another important force for hybridisation identified in the Model was the rise of new occupational specialisms. Much was made in Chapter Five of the emergence of business analysis as a separate occupational category. Although the data presented so far appears to suggest that the main effect has been descope the role of the systems analyst, the business analyst role is one that systems analysts can move into. At Company B and D all but one of the business analysts interviewed had previously been systems

analysts. Moreover, there was a strong feeling that their technical background was useful in carrying out their current functions:

> I *don't think I could do my job properly without a good grasp of IT. I don't see how you can tell a user whether you can build a system if you haven't built a system yourself because you have to have a rough idea of whether what he wants is technically feasible.*

The emergence of the business analyst role had thus created new opportunities for systems analysts and sent a clear message to technically oriented staff and users in the business areas that hybrid skills were important.

The occupational community was identified as a potential force for hybridisation in Chapter Two. All the analysts were located in large, centralised IS departments and mixed almost exclusively with IS professionals. The conditions were ripe, therefore, for the formation of a strong occupational identity. The occupational community would be a force for hybridisation if it lobbied on its own behalf and identified strongly with the goals of integrating the business and IT. While there was evidence in the interviews that analysts saw themselves as a different group from users they were not an occupational community in the sense described by Van Maneen, i.e. a group who "share a set of values, norms and perspectives that apply to but extend beyond work related matters ... and whose social relationships meld work with pleasure". Analysts' were quite explicit in stating that they did not mix outside office hours. In interviews it was clear that the systems analysts had not lobbied the organisation to integrate IT and business (most expressed a strong distaste for organisational politics) but the business analysts at Company B did act

on their own behalf to try to *avoid* being moved into the Development Section.

User pressure was also a powerful force for hybridisation identified in the Model. A particularly good example of this was at Company D. At the time of the re-organisation at Company D there were rumours that the entire function would be outsourced. This reflected the level of disillusion which existed in the user community. According to one of the business analysts:

> *A user and an IT person could have sat down at the same meeting, agreed exactly what they were going to do, and then come away with two completely different sets of ideas about what would happen.*

It was to address this problem, that management decided to restructure the old IT Division. The effect of the changes has been to increase the degree of control the business areas have over IT and to make the analysts, and other IS professionals, more aware of the needs of the business:

> *We weren't very responsive to users ... its true .. that's why they decided to bring in users from the business areas .. and why we are now responsible to them.*

A key force for hybridisation at Company D, therefore was pressure exerted by users.

The final force for hybridisation identified in the Model was the analyst's orientation and aspirations. Data presented in Chapter Five indicates that over half of the analysts aspire to a management career. This may suggest that they have an interest in the business. There was certainly strong

awareness in all companies that the main career route was through the management grades. However, there were differences between the companies in terms of the stated career preferences of the analysts. At Company B, for example, three analysts hoped to become project managers within the next five years whereas no one at company A entertained this ambition. Management at Company B and Company D had also encouraged the analysts to communicate directly with users, something which the analysts clearly enjoyed and was considered a positive outcome of the re-organisation. While the evidence generally suggests that the analysts have strong technical orientation, therefore, management policy at companies B and D may have influenced aspects of the analysts' behaviour.

6.3 Forces for Specialisation in the Inner Context

The previous section suggests that there have been forces pushing for hybridisation in all the case study organisations but that these have exerted a stronger impact at companies B and D than the other organisations. In all the organisations, however, there have been forces constraining hybridisation and pulling them in the direction of greater specialisation. This section examines the nature and impact of these forces in more detail.

Although a company's corporate and IS strategies can be a force for hybridisation, the Model presented in Chapter Two suggests that they can also be a constraint on development. This is the case with regard to Company A which, it will be recalled, had become part of another organisation. At Company A, the new management's strategy was to create a worldwide operating system that would enable it to integrate the disparate systems which existed in different parts of the world. Although

this was necessary to enable the company to compete with other organisations that had already installed integrated systems, the outdated technologies that were being used to achieve this integration was, in the analysts' eyes, a major constraint on the development of their role. The emphasis on cost-cutting within the Company was also a constraint since it reduced the scope for development work and the opportunity to acquire new skills in modern technologies. Many of the analysts felt that this was a force for specialisation in their role and was a source of much frustration.

> *Five years ago in IT, perhaps a little more, new systems were being developed, money was being spent, opportunities were opening up. Under the new management, money is very tightly controlled, new projects are extremely rare ... in reality there is far less development. This is causing frustration.*

A further "technological" constraint on development was the use of legacy systems. All the companies, including those that had invested heavily in new technology, were still dependent on legacy systems to support routine transactions. The need to maintain these systems meant that there was a continuing demand for staff who had skills and experience in the use of the old systems. The analysts clearly felt that this was a major cause of technological obsolescence. At Company A, one of the analysts observed that:

> *My colleagues and I have very specific knowledge of the system we look after but none of this knowledge, or our skills, are any use in the rest of the organisation. It would be difficult for the company to offer me a post as a senior technician in another area if I have no expertise.*

At Company C, an analyst who had been working on legacy systems for the last five years, complained that:

> *I've been pushing for a move now for over a year but I'm not releasable. And when the release date comes up it is rescheduled.*

This quote suggests that there is almost a "managerial" conspiracy to restrict internal mobility of certain staff. In interviews it was clear that senior managers knew that specialisation was a problem but were unwilling to do anything about it, largely because analysts working on these systems possessed skills that were valuable to the organisation. The only Company that had tackled the problem was Company B where the system of resource pooling ensured that analysts did not stay long enough in one area to develop highly specialised skills.

A company's human resource policies was identified in the Model as another force for specialisation. This may be the case where (a) human resources, IS and business strategies are not effectively aligned; (b) there is little actual change in human resources policy or (c) the policies do not reflect the strategic objectives of the organisation. Although, as suggested earlier, changes in human resources strategy have been instrumental in bringing about change in the case study organisations, none of the managers felt that there was a close alignment between IS strategy, business strategy and human resource strategies in their organisation or within the IS department/division. Companies B, C and D believed that they were "loosely aligned" and were moving together. In interviews, managers at companies A and E were extremely critical of their company's human resource strategies, and felt they failed to adequately support change. This tended to be because the Personnel Department was "reluctant to get involved" and found it difficult to "police" those measures it did implement. They believed that this had slowed the pace of

development and made it difficult to introduce radical change. The impact of the organisation's career system (a product of its human resource policies) is discussed in more detail in Section 6.4 which examines the mechanisms for bringing about change in roles.

Continued use of old approaches to systems development was also identified as a force for specialisation in the Model presented in Chapter Two. As suggested previously all the organisations were using "new" methods such as Prototyping. When analysts discussed their role, however, it was clear that they saw it in terms of structured approaches to development. Many of the analysts took the view that users lacked the skills to make a significant contribution to systems development. As one of the analysts at Company E observed:

> *... in practice, when you get past business system design and start to get a bit more technical .. the users' involvement drops off ....*

Although this may simply reflect the analyst's desire to maintain the mystique of the profession, if users are perceived to lack the skills to contribute significantly to systems development, this might influence the relations between the parties and the scope for cross-fertilisation of skills.

A further constraint on hybridisation identified in the Model was the supply of labour. Although the organisations had recruited people with non-technical experience, the findings indicate that it may be difficult for them to maintain their business currency once they are recruited into the IS department/division. The systems analysts at Company D, for example, had observed that business analysts recruited from user areas tended not to return to the business and that they were in danger of losing touch with

what was happening in the business areas. At Company B, senior managers were aware that the decision to bring the BA Section within the Development Section would weaken their links with the business. The decision to recruit users may therefore be less effective as a force for hybridisation than first thought.

Organisational structure was identified as a force for hybridisation but it may equally be a force for specialisation. All the organisations suffered from the problems of bureaucracy and functional specialisation partly because they were very large and partly because, over the years, they had evolved a structure that was highly segmented. As a result staff tended to develop skills in their area of the business and knew little about what was going on elsewhere. Analysts at all the organisations freely admitted that they had little knowledge of other parts of the organisation. At Company D, for example, where analysts had been assigned to specific processes, they tended to be knowledgeable about their own process but not about others.

Lack of understanding or awareness of the business was also a major problem at companies A and C. At Company A, an analyst stated that working in his department was "like being shut away in a little room". At Company C one of the analysts commented that:

> *I am very ignorant about the organisation because we have little contact outside IT. We are quite isolated from the rest of the business.*

Neither company offered opportunities to find out about the business through training or secondment, etc.

The last point underlines the importance of physical location in determining the scope for hybridisation. The majority of the analysts were accommodated in centralised IS divisions and worked in close proximity. The Model presented in Chapter Two identified this as a major force for specialisation. This is borne out by the findings. When asked about career development, most had no desire to move out of IS into the business areas. The reasons given were that they enjoyed being part of central IS and felt that pay and career prospects were better than elsewhere in the organisation. Even in organisations that had re-aligned parts of the IS Function with the business areas, and where the roles of the analysts had become more broad-based, the analysts clearly preferred to make their career in IS. Physically grouping the analysts together in a centralised structure could therefore be regarded as a force for specialisation in all the case study organisations.

The structure of an organisation is one of the factors that shapes its culture. If the structure is functionally specialised, the culture may reflect this. An organisation's culture was therefore identified in the Model as a force for specialisation. In Chapter Four it was suggested that all the companies had attempted to change the culture of the organisation, to make it more dynamic, more flexible and task-centred. While this appears to have been moderately successful at companies B and D, the culture of companies A, C and E had proven more resistant to change. These organisations still had a very traditional role culture. When asked to describe the culture at Company A, one of the analysts observed that:

> *It's an old institution and does not move easily. There is a sense in which the new owner is even older, more behind the times and stuck in its ways. It is conservative and risk averse ... It is paternalistic and male dominated. Gaining high*

position depends on who you know rather than what you know.

and at Company C:

There isn't much managing by wandering around or anything like that... It is a very hierarchical, command and control-centred, bureaucratic organisation.

The findings of the research suggest that the culture of the company does exert an influence the culture of IS department/division. At Company C, the analysts thought that Group IS was "like a large oil tanker, slow and difficult to move". At Company A, the analysts described the culture in the Systems Development Department as "very inflexible and resistant to change". It was clear from both the analysts' and managements' comments at Company A that this reflected the management style of the overall head of IS. The latter had risen through the ranks and had a reputation for being extremely tough and autocratic. The effect, in their view, was to stifle innovation and perpetuate the strong technical ethos in the Systems Development Department.

The culture at all the companies, however, could be characterised as autocratic. Even those companies that had attempted to change this, i.e. companies B and D, there were still perceived to be obstacles to developing a more flexible task-based culture. Both analysts and managers felt that senior managers, who had grown up with the old system, found it difficult to change and to provide the kind of leadership necessary to make the organisation more flexible and responsive to business needs.

The last point suggests another important constraint on hybridisation identified in the Model - traditional divisions of labour. Multi-skilling can erode traditional divisions of labour and threaten the status quo. It was this which prompted some of the older managers to obstruct the change process at companies B and D. At Company B, some of the senior managers in IS, described by staff as the "old guard", had succeeded in circumventing the Resource Pool system. The latter shifted control over resources to managers lower in the organisation and was perceived by some to undermine their authority. The business analysts at Company B were also keen to maintain traditional divisions of labour, i.e. between themselves and the developers. They lobbied senior managers in the business areas in a bid to retain their independence. Although they were unsuccessful, the determination of the analysts to avoid being moved into the Development Section underlines the point that there are powerful political forces that may slow down or prevent change occurring.

One of the aims of bringing the business analysts into the Development Section at Company B was to "seed" their expertise. The emergence of business analysts as a separate occupational category, however, tended to be a force for specialisation in the role of the systems analyst. In all the case study organisations the business analysts had taken over responsibility for areas that would a few years ago have been considered the traditional terrain of the systems analyst. Although in the previous section it was argued that systems analysts could become business analysts and resume these tasks, the findings suggest that this role transition is, in practice, difficult to effect. At Company D, where business analysts had been recruited from the ranks of IS professionals, the evidence suggests that they are treated differently from users who become business analysts. They are still viewed by their colleagues and the user community as

technical experts and called upon to perform technical tasks. In other words the expectations of the role have not changed. It will be recalled that one of the business analysts at Company D commented that it was very difficult to gain the trust of users. Even at companies where systems analysts have been given the opportunity to carry out a more business oriented role, therefore, it would appear that there are forces undermining this.

One of the factors that was constraining hybridisation in all the companies was management strategies of control. This was particularly evident at Company A and Company E where both managers and analysts observed that the autocratic "command and control" style of management at senior levels in IS was a formidable barrier to change in structure, culture and roles. The degree of control exercised at lower levels in each of the companies was also a constraint. At Company C, for example, project managers had contrived to retain valuable staff in spite of pleas by senior management to release them. Even at companies B and D where most change in roles had taken place, there were limits to the amount of discretion the analysts had over their work. One of the problems of the Resource Pool System at Company B, for example, was that the analysts may be deployed to work on a project that they had little interest in. Although they could approach their Resource Pool Manager about this, the system clearly placed control very firmly in the hands of management. The movement of staff was controlled by the Resource Pool Managers. At Company D, analysts had control over systems in their area but it was extremely difficult, in practice, to move outside this area.

The decision to bring the business analysts within the IS department/division could also be viewed as a managerial device to gain

control of labour. In interviews both systems and business analysts felt that the decision was politically motivated. The presence of a group of business analysts operating at a fairly high level in the organisation, empowered to advise users not to proceed with projects could certainly be viewed as a threat. Managers at Company B and C admitted that there was concern about the degree of discretion business analysts were given in determining whether development should proceed on a project. While integrating the business analysts within the IS department/division would be a force for hybridisation within IS, evidence that the strategies management used to control the analysts were a force for specialisation is reflected in the comments of one of the analysts at Company E who expressed his frustration at not being given the "freedom" to develop a relationship with users in the business areas. The business analysts at Company D complained of similar constraints.

Earlier it was suggested that the occupational community could be a force for hybridisation where members of the community are strongly committed to the goals of the organisation and see the function of IS as one of serving the business areas. Although all the analysts enjoyed helping users, the strong technical ethos of the IS department/division at most of the companies was a barrier to change and hybridisation. At Company A, the analysts saw a very clear distinction between themselves and users and believed that the latter were not in the best position to decide their own information needs. The strong emphasis on cost cutting within the organisation and the move towards standardisation gave IS management greater power than they had previously over users and was a factor influencing analyts' perception of their relationship with users. The IS manager who was interviewed felt it was important that IS professionals did not get "dragged into the business" because they may be

persuaded to develop systems that met users "wants" but were not cost effective. When questioned, some of the analysts clearly saw it as part of their job to curb user "excesses".

The limited amount of formal and informal contact the systems analysts had with the users exacerbated the cultural distance between IS and the business areas. The business analysts were the main formal channel of communication and management at companies A and C were keen to keep it that way. Although there were opportunities for the analysts to mix informally with users, this rarely happened in practice. At Company A one of the analysts expressed horror at the suggestion that he might meet someone from another department informally for lunch!

User apathy is another force for specialisation identified in the Model of the Forces Driving and Constraining Hybridisation. Earlier it was suggested that the analysts believed that users had few technical skills, a factor which limited their ability to contribute to the development of projects. Although it was not possible to measure levels of computer literacy in the case study organisations, there appeared to be a "leave it up to the technical experts" attitude in those organisations where the roles of the analysts were more specialised. At Company E, for example, both analysts and management commented that it was difficult to get users committed to projects. One of the analysts who had recently completed work on a medium-sized project observed that users had wanted the systems staff carry out all the testing. At Company A, the financial constraints on development meant that analysts were under strong pressure "not to give into user demands". Instead of driving systems development, as they had done a few years ago, users were expected to "put up and shut up". This placed the systems analysts in a relatively

strong position but discouraged the development of a co-operative relationship with users. User apathy or powerlessness could therefore be viewed as a force for specialisation in some of the case study organisations.

The final constraint on change is the analysts' orientation to their role. In Chapter Five it was shown that the systems analysts tended to define themselves as technical specialists, regardless of their background. This was particularly the case in companies A, C and E where the technically challenging nature of the work and task variety were key motivators. There was a stronger interest in the business at companies B and D where the analyst's role was defined more broadly but even here they did not envisage moving out into the business areas or making a career outside central IS. The analysts' interests, attitudes and aspirations could therefore be regarded as a constraint on hybridisation.

6.4 Mechanisms for Bringing about Change

In Chapters One and Two it was suggested that the main organisational mechanism for bringing about change in roles is the organisation's career system, i.e. its policies for recruiting, training, assigning appraising, promoting and retiring staff. The career system is crucial because it has the most direct effect on individuals. However, it was also suggested that change in roles is dependent on the willingness of members of staff to change their attitudes and aspects of their behaviour in accordance with managerial objectives. Given that change hinges on these factors, it is important to examine the extent to which they were a force for or against change in the case study organisations.

6.4.1 The Career System

The changes that the companies had made to their career system in recent years were outlined in Chapter Four. It will be recalled Company A had reduced the number of management positions and introduced a new Career Review. Company B had "phased" in resource pooling, appointed Resource Managers, made the appraisal system much more rigorous and placed all new staff on temporary contracts. Company C had sought to create an internal labour market, replaced job descriptions with role profiles, improved the appraisal system and boosted staff training. Company D had devised new competency ratings which attached greater importance to non-technical competences, introduced a new business analyst career path and altered pay scales to reflect the importance of hybrid competences. Finally, Company E had devolved responsibility for career management to project managers, appointed business analysts and revised pay scales so as to offer the latter much higher rewards than systems analysts.

When probed about the career system in the interview, managers clearly saw it as an important mechanism for bringing about change in roles. All recognised the importance of recruitment in influencing the calibre of staff and were keen to recruit "generalists" into IS department/division. Managers at companies A and E, however, felt it was important to ensure that recruits had a technical aptitude and technical skills. Company A had begun recruiting A-level entrants into programming roles. The data presented in Chapter Five suggests that while the companies have recruited people with non-technical experience, they are keen on technical qualifications. Also, none of the companies had made any fundamental changes to their recruitment policies. All continue to maintain a separate

recruitment scheme for those entering IS and the "main" business. This initial division of labour between "specialists" and "generalists" underlines the separateness of the IS Function and may reinforce cultural barriers to hybridisation.

The second element of the career system that may influence the scope for hybridisation is training related to the job or for future roles. To find out about company training policies, analysts were asked if they had received training in any of the following areas: systems analysis; people management skills; project management skills and other business areas. In interviews a short description of each was given to ensure consistency in responses [1].

Systems analysis

Definition of requirements, scope and objectives of systems; gathering requirements; system design; evaluating system against user requirements

People management

Interacting with others - end users, other systems analysts, managers, vendors; interview skills; counselling; delegating; monitoring performance; stress management; sensitivity training; influencing skills

Project management

Planning, organising, controlling, implementation and evaluating a project; resourcing issues; leadership and motivation; team building skills; negotiation skills.

Business skills

Business planning and forecating; IS and business strategy formulation; financial and marketing techniques; competitive analysis; internal organisational analysis; environmental analysis.

The key finding was that although seventeen members of the sample had received some training in people management, only nine had received instruction in business skills or the business functions.

When asked to describe the training which had been provided in business, it is clear that most had either obtained an off-the-shelf package from the company's library and taught themselves or had been on a short external course. One of the systems analysts at Company A, for example, had signed up for a two day accounting course run by an outside company. The analysts were highly critical of the paucity of training in business analysis, clearly believing this to be a constraint on personal and organisational development. One of the business analysts at Company B, observed that:

> *... there isn't any training to perform the business analyst role ... You need to have a fairly high level knowledge of a lot of different things ... but a lot of it is down to observation and personal initiative. We do need training in business analysis.*

At Company D, the analysts felt that failure to provide training in business analysis had cost the company millions of pounds in project overruns because both business and systems analysts lacked the techniques to analyse the underlying business problems.

The findings indicate that the organisations provided few opportunities to gain practical experience of working in the business areas. Analysts at two of the companies, D and E, had requested this themselves and were allowed to spend a few days wandering around observing how the branches in the regions operated. Both reported that the experience was "enormously beneficial" because it enabled them to see, first hand, the environment in which the systems would be used. While they had stated this to management, there was a feeling that arranging such ventures was "difficult".

Although training was frequently cited as a major constraint on change, one company had sought to address this problem. It will be recalled that Company C had introduced an Out-Of Hours training policy as part of its change management programme. The aim of this initiative was to enable staff to up-date themselves on the new technologies. This should have been a major force for hybridisation, particularly for those staff who had been assigned to work in areas requiring specialised skills or knowledge of legacy systems. This was not the case in practice, however. To benefit from the training, staff have to demonstrate that the skills they would learn would be directly transferrable to their present job. This is impossible for staff working on legacy systems. Also, Out-Of Hours training is only available at headquarters. Only those working at, or close to, headquarters can realistically take advantage of it. Instead of boosting morale, as it was intended to, the analysts felt that Out-Of-Hours training had added to the frustrations of staff.

The third element of the career system identified earlier was assignment to different roles or positions. If analysts are to develop hybrid competences, it is important that they gain experience of working on different projects in

different areas and that there is scope to gain some practical exposure to the business. The amount of mobility varied considerably within the case study organisations. At Company A, which had not introduced any policies to stimulate internal mobility, there was very little movement of staff between departments and managers there saw this as a major constraint on development. Company C had taken steps to increase internal mobility by encouraging the analysts to apply for jobs internally and through role profiling. However, it would appear that neither policy has been particularly effective in achieving this objective. Commenting on the internal labour market, one of the analysts at Company C remarked:

> *The internal labour market is a good idea .. it should have worked. It would have helped me to get out of my current job ... the problem is that senior management can't enforce it ...*

The introduction of resource pooling at Company B had stimulated mobility but here, as in the other case study organisations, there was very little movement of staff from IT into the business areas. Although it is true that few of the analysts were enthusiatic about moving out into the business, those who did want to were put off by the apparant difficulties of finding a niche in the business areas and then being able to return, if they so wished.

The fourth element of the career system is appraisal. All the case study organisations had used this as a means of bringing about change in the analyst's role. However, only Company D had introduced changes to the system which clearly linked pay and promotion prospects to the acquisition of hybrid competences. The business analysts from user areas at Company D would not be paid the same salary as the systems analysts

until they had acquired the necessary technical skills. The introduction of new competency ratings for technical staff emphasised the importance of non-technical skills such as motivation and leadership. When asked what factors had most impact on their attitude to their role, the analysts clearly stated that it was changes in the appraisal system.

> *The thing that has made the biggest difference to the way I see my role is the new competency ratings. There's a much stronger emphasis on non-technical skills such as leadership and motivation. They weren't so bothered about this before.*

One expressed concern that when the new competency rating were introduced there was fear that some people would lose their job because they would not be able to meet the requirement to demonstrate motivational and leadership skills.

A key factor influencing analysts' perception of their role was the low status generally accorded technical specialists. Although all the companies had a technical career route and companies B and C had recently extended this to improve the pay and prospects of technical staff, a technical career was not considered by the analysts to be a viable option. The majority of analysts felt that the technical career path did not offer adequate remuneration or status.

> *I am interested in the technical side of things ... But I won't stay on the technical side here because you can't earn as much. The career prospects for technical staff are definitely not as good as they are for managers.*

While status differentials between the career paths for specialists and generalists underlined the importance of generalist skills, this had, of

course, created another dilemma for management. Corporate downsizing meant that there were fewer career opportunities for managers in IS. However, none of the organisations had attempted to overcome this problem by taking the rather more radical step of introducing a career path that leads out of the IS department/division into the business areas.

The final element of the career system is the organisation's policies for retiring staff. This refers to the decisions about which members of staff should be retained and which should be released because their skills are no longer considered valuable to the organisation. No data was available on retirement or redundancies. However, the analysts' perception in all the organisations is that generalists are more at risk than specialists. Although the organisations do not reward technical skills as highly as managerial skills or confer on them the same status, as long as the technician's skills are current they are perceived to be in a more secure position. Feelings of insecurity were greatest amongst the older members of staff but many of the analysts had observed that there was less job security and fewer opportunities to gain another job amongst those with mainly managerial experience.

Overall, the findings indicate that there are many aspects of the career system that do not encourage the development of hybrid competences, particularly the lack of training in business skills and the apparent difficulty of obtaining experience outside the IS department/division. Only companies B and D had introduced changes that offer significant opportunities for the analysts' to acquire a wider range of skills and experience within the IS department/division. Little change in the career system has taken place at companies A and E. At Company A, the policy of recruiting A-Level entrants who will want to remain "on the technical

side" is likely to reinforce the technical ethos within the IS Function. At Company E, the decision to remove resource managers means that there is less scope for monitoring the careers of staff and increases the possibility that staff will become specialised in particular areas. At Company C, the provision of Out-of-Hours Training and introduction of new appraisal and role-profiling systems are intended to broaden roles but as the previous section suggested, the underlying structure and culture of the organisation is acting as a constraint on these changes.

6.4.2 The Individual as a Change Agent

The findings of the interviews suggest that the analysts were firmly behind the changes at companies B and D. The analysts at Company C could see the necessity for the changes but did not feel they were working. At Company A and E the analysts were negative about some aspects of the changes that had taken place. The question arises of the extent to which these different responses influenced their attitudes. At companies B and D the analysts expressed a stronger interest in the business than at the other companies. However, in both cases there were incentives to co-operate with the changes. In particular, analysts were given the opportunity to broaden their skills base without losing their technical currency.

The same could not be said of companies A, C and E. At Company A the analysts had a strong technical orientation. Here, management strategies for IT completely failed to satisfy the analyst's needs and was a major source of dissatisfaction. At Company C, though the changes in the appraisal system benefited staff, the problems of getting access to Out-Of-Hours training, coupled with what was perceived to be the failure of many management initiatives, had produced a negative reactions amongst staff.

> *Morale here is very low at the moment. Staff are beginning to leave ... most people I know here would not recommend working in IT at the Company to their friends.*

At Company E, the appointment of business analysts who were being paid at a much higher rate, had produced a negative response. However, this was compensated for by the Company's massive investment in new technology. Analysts at Company E felt that they were deriving enormous benefit from exposure to up-to-date technologies and that they could transfer the skills they were acquiring to other companies.

6.5 Summary

This Chapter has drawn on the models presented in the thesis to analyse the forces driving and constraining hybridisation in the roles of the analysts who took part in the research. It has been suggested that the roles of analysts at companies B and D have become more broad based and business oriented because the forces for hybridisation have been greater than the forces for specialisation. At both companies the pressure to develop analysts with broader abilities arose from pressures for change in the outer and inner context. In the inner context, changes in corporate strategy, the technology the organisation was using and pressure from users who wanted a better service from the IS department/division were particularly important. These factors resulted in changes in the structure, culture and career systems of the organisations which would foster a more business oriented ethos in IS and develop analysts with a broader range of skills.

Although companies A, C and E were faced with similar pressures for change, the outcome has not been the same. In these organisations, the roles of the analysts remain quite technically defined or specialised. The reason, it has been suggested, is that the forces for specialisation were greater than the forces for hybridisation. Continued reliance on particular types of technology, the unwillingness or inability of management to bring about significant change in the structure and culture of the organisation, inadequate or insufficient changes in the career system, the analysts' strong technical orientation, etc. conspired to limit the scope for change in the roles of analysts.

END NOTE

1. The description of the skills categories was derived from reading the following: System Analysis (Mason and Willcocks, 1994); People Management (Hunt, 1992); Project Management (Cleland and King, 1983; Young, 1993); Business Skills (Thomas, 1983; Luffman et al, 1991).

CHAPTER SEVEN
Conclusions

7.0 Outline of the Chapter

This Chapter provides a summary of the investigation; identifies the main conclusions that can be drawn from the findings; reviews the theoretical and methodological basis of the research and indicates how the research could be developed in future. In terms of conclusions, the results suggest that the impact of change on the role of the analyst may vary between organisations and reflect the influence of contextual factors; that rapid or dramatic organisational and technological change does not necessarily create conditions that foster hybrid competences and that there may be considerable constraints on developing hybrid analysts. The theoretical framework used to interpret the findings was found to be useful, though the fields of force model requires some refinement. With regard to methods of data collection, the case study approach yielded valuable insights into the impact of change on the analyst's role and helped to fullfil the aims of the research. Finally, it is argued that although the research contributes to an understanding the impact of change on the systems analyst's role, more contextual studies are needed on the impact of change in different organisations and on different occupational groups.

7.1 Summary of the Research

The main aims of the research were identified in Chapter One. They were to explore the impact of organisational change on the roles of a group of systems analysts; to ascertain the analyst's perception of the impact of change on their role and to identify any factors that may be impeding the

hybridisation of the role. The idea for the research arose from a review of the IS literature on roles and skills. This revealed that there were few studies of the impact of change on IS roles, IS professionals' perception of the impact of change or constraints on change in roles. It was to fill this gap in the literature, and provide data that would be of value to practising managers, that the research was undertaken.

In Chapter One a theoretical framework was developed to interpret the impact of change on roles. This identified the factors that influence the way roles are defined and develop and adapted Lewin's fields of force concept to explain the process of change in roles. A distinction was drawn between factors in the outer context and the inner context that influence roles. The outer context included macro-environmental factors, sectoral and occupational influences. The inner context included organisational and individual factors. It was suggested that factors in the inner and outer context may bring about change in roles. Thus, change in the macro-environment may stimulate change at the sectoral level which may in turn influence the structure and functioning of organisations and, through this, the roles of IS professionals. Conversely, change in the roles of IS professionals may stimulate change in organisations which may, in turn, impact on the outer context. The basis for this argument can be found in a number of theories, including General Systems Theory. The latter suggests that any organism can be viewed as a whole composed of interdependent parts. Change in one part of the system will therefore lead to change in other parts of the system. Since organisations are composed of interrelated sets of roles, any change in roles will influence the functioning of the organisation and any change in the organisation will influence roles.

As well as forces driving change, there are also forces constraining change in roles. The theoretical basis of this argument derives from functionalism and the assumption that in any social system constraints arise to protect the system from anything that may jeopardise its survival. It was argued that an understanding of the impact of change on roles requires an understanding of these constraints and hence the dynamics of the change process. Lewin's fields of force model of the change process was adapted to explain how change may come about in roles and some of the impediments to change. Lewin maintained that in any situation there are forces "pushing" for change and forces "pulling" in the opposite direction. The factors that had previously been identified as having an influence on roles in the outer and inner context were considered in terms of this argument.

It was suggested that any of the factors in the outer or inner context could be forces for change or forces against change, depending on the circumstances. The main means of effecting change in roles was the career system and the actions of the role occupants themselves. The career system was considered important because it has the most direct effect on the way people work. Any change that occurs in roles, however, is the result of individuals altering their behaviour, hence the importance of individual actions in the change process.

A central part of the argument in Chapter One was that organisations respond differently to the impact of change and that the roles of IS professionals in different organisations will reflect this diversity. The theoretical basis of this argument derives from contextualism and contingency theory. Contextualism suggests that to understand the nature and effects of organisational change it is necessary to focus on the specific

features of the situation - the history of the company, its structure and culture, strategies for managing the business, etc. Contingency theory maintains that there are no universal laws which govern behaviour and that organisations differ, albeit in consistent ways. Although there may be forces in the outer context at the sectoral level which appear to be driving organisations (and hence roles) in the same direction, the context of change will be different for each organisation because their history, structure, culture, the type of people they employ, etc. will differ in some respects.

Having identified the factors that influence roles and the process by which change in roles may come about, research was undertaken on the impact of organisational change on the roles of systems analysts. While any occupational group could have been selected, systems analysts were considered a particularly good choice because there is a growing body of literature which suggests that their role is changing and that they are becoming "hybrids". Since much of the current debate on roles and careers in IS focuses on the need for hybrid IS professionals, it would be of practical value to examine this argument in relation to the analyst's role.

Chapter Two described the evolution of the systems analyst's role and assessed its current status. A systems analyst was defined as someone who investigates business problems and uses their knowledge of different approaches to systems development to create computer-based solutions to those problems. A review of the literature suggested that although the main thrust of development in the role has been towards developing business and generalist skills, it still appears to be very technically focused. To explain this apparant contradiction, the thesis drew on the theoretical propositions developed in Chapter One. According to these propositions,

the analyst's role would be strongly influenced by contextual factors. It was therefore suggested that the extent to which the analyst's role had become hybridised would vary between organisations. In Chapter One it was also suggested that there are factors which slow the pace of change in roles. It was further suggested, therefore, that in any organisation there would be factors which constrain the scope for hybridisation in the analyst's role.

The research was carried out on the roles of thirty-five systems analysts employed in organisations in the financial services and retail sectors. Three were financial service companies (companies A, B and C) the other two were retailers (companies D and E). Organisations in these sectors were selected as suitable cases because they have been subject to very rapid change in the external environment, are dependent on technology and employ large numbers of IS professionals. Such organisations would, presumably, be more motivated to develop hybrid analysts than organisations that have not been subject to so much change or are less reliant on IT. The research was based in two sectors to examine the influence of sectoral forces on organisations and roles.

The forces in the outer context that have created the stimulus to organisational change in the five organisations that took part in the research were examined. A model was presented which highlighted the importance of domestic and international competition, changes in the legal framework, changing social attitudes, demographic factors and advances in technology. While these forces have exerted enormous pressures on organisations to change, it was argued that (a) not all organisations would react in the same way to the impact of externally imposed change and (b) there would be internal pressures to maintain

stability and cohesion in organisations which would reduce the impact of change.

The main changes that had taken place in each of the five case study organisations over the last few years and in the analysts' roles were described in some detail. The most radical organisational changes in IS had taken place at companies B, C and D. Here the IS department/division had been completely re-organised and the method of allocating work to projects overhauled. At Company D the entire organisation, including the IS Division had been process re-engineered over the last eigtheen months. In these organisations and in the remaining two - Company A and Company E - there were limits to the extent of change that had taken place, e.g. IS professionals were still grouped together in the same geographical location and none had moved into roles in the business units.

Having established that there were forces for and against change in the organisations that took part in the study, Chapter Five examined the background of the sample selected and the nature of the roles they carried out. The key findings with regard to background were that (a) most of the sample had quite a strong technical orientation though they had gained experience in non-technical roles before joining their present employer (b) many intended to pursue a career in management but retained a strong interest in the technical aspects of development. Analysis of the sample and of the roles of the analysts revealed interesting differences between the organisations. While all the organisations had divided the systems analyst's role between two occupational categories - business and systems analysts, the roles of the systems analysts were more technically defined in companies A, C and E. In these companies the analysts tended to have substantial technical experience; had limited contact with users; were

responsible for systems that required specialised knowledge and skills and worked in an environment where technical skills were highly valued. At companies B and D, less importance was attached to programming skills; there were opportunities to acquire a broad range of skills working on different systems and contact with users was encouraged. While all the analysts had a fairly strong technical orientation, there were also differences between the organisations in terms of the analyst's orientation to their role and career goals.

The Model of the Forces in the Inner Context Driving and Constraining Hybridisation in the Role of the Systems Analyst was used to explain these differences. It was argued that the forces for hybridisation were greater than the forces for specialisation in companies B and D but that there were constraints on change on the roles of the analysts in all the organisations. These were partly a result of organisational factors and partly a result of the analysts' own interests and orientation to their role.

7.2 Key Conclusions of the Research

On the basis of the empirical findings it is possible to draw a number of conclusions about the impact of organisational change on the role of the systems analyst. Firstly, the finding that roles had remained technically defined at three of the companies and had become more broad based at two suggests that the effects of change may vary between organisations. In the present research, these differences had arisen because the companies reacted differently to external and internal pressures for change. Thus, although they were all confronted with similar external pressures, particularly the growth in competition, they reacted to these pressures in different ways. Company D, for example, re-engineered the business,

Company E embarked on an ambitious programme of opening new stores and changed its image. The internal pressures for change also varied between the companies. In some of the companies, the pressures were sufficiently great to move them in the direction of developing hybrids, in others the constraints on change were more powerful. The findings of the research therefore support the work of contigency theorists who emphasise the differences between organisations and contextualists who maintain that an understanding of the impact of change requires an understanding of the context in which change takes place.

The finding that change in roles is influenced by the context suggests that some factors may have a more direct or powerful impact on roles than others; that factors may interact in different ways to influence roles; and that the effects of certain factors may vary according to the circumstances. With regard to the first point, for example, changes at the sectoral level provided the context for change at the organisational level but did not have a direct impact on roles. Analysts tended to be more influenced, in practice, by what happened in their immediate environment. It will be recalled that the analysts at Company D, for example, commented that the change that had most impact on their attitude to their role was the introduction of competency ratings. If analysts could not meet the criteria stipulated in the ratings, they feared they may lose their job.

With regard to the differential impact of some factors, a good example is the influence of leadership style on roles. The findings indicate that leadership style in IS varied between the organisations and influenced roles in different ways. Thus, the highly autocratic style of leadership at Company A stifled innnovation and was regarded by both analysts and management as a significant constraint on change. At Company B, the

more "enlightened" philosophy of senior management, reflected in the introduction of resource pooling and the commitment to develop user-friendly systems, was a factor driving change in roles. The finding that the impact of change on roles varies according to the context and that the same factors can influence roles in different ways suggests that the process of change in roles is more complex than is often presented in the IS literature.

Another key finding of the research is that rapid or dramatic organisational change does not automatically propel organisations in the direction of developing hybrids. The BCS in its report on hybrid managers quoted in Chapter One suggests that hybrids are most likely to emerge just before or during periods of rapid change or when the organisation is experiencing a "crisis" (BCS, 1990). The logic behind this argument is that rapid/dramatic change loosens the normal constraints on change and creates optimum conditions for innovation. In spite of the enormous changes that had taken place in all the organisations, none had succeeded in developing hybrid analysts. Although both Company B and Company D were defining the systems analyst's role more broadly, the business and systems analysis roles were still treated as distinct occupational categories at each of the companies and most of the systems analysts had limited opportunities to gain business experience. Even during periods of rapid change, then, when the scope for innovation is greatest, it may still be difficult to develop hybrids.

The companies that took part in the research had not only experienced dramatic change, they were also dependent on IT. Stage Hypothesists would argue that the organisations' dependence on IT would be a critical factor pushing them in the direction of developing hybrids. The findings

of the research suggest that this is not necessarily the case. The impact of technological change varied considerably between the companies and had different effects on roles. At Company B, where management were investing in a new tool that would help users develop their own applications, the introduction of new technology was a factor that contributed to the hybridisation of the role. At Company A, where management were using older technologies and seeking to reduce development costs, technology was a factor that constrained the hybridisation of the analyst's role. The findings of the research therefore cast doubt on the assumption that there is a linear relationship between technological change, organisational change and change in roles and suggest that there may be significant constraints on hybridisation.

The last point draws attention to one of the most important findings of the research, i.e. the constraints on hybridisation. The literature review in Chapter Two quotes many articles, reports and surveys which suggest that analysts are turning from technicians into hybrids or business analysts. The findings of this research, however, indicate that even in organisations that were keen to develop a more broadly skilled IS workforce there were formidable constraints on hybridisation. These constraints arose from the structure and culture of the organisation, the vested interests of particular groups, reliance on old systems, etc. and limited the scope for change in roles. However, the fact that roles had become broader at two of the organisations suggests that the constraints on change are not insuperable. Where the forces for change are greater, the analyst's role may become more broadly defined. The findings of the research do not therefore support the work of Todd et al (1996) quoted in Chapter Two which suggest that the trend has been for the analyst's role to become more technically defined. The findings of this study suggest that it is difficult to generalise

because the effects of change vary between organisations and reflect the influence of contextual factors.

In chapters One and Two it was suggested that the analyst's orientation to their role may be a constraint on change. This was one of the reasons the research focused on the analyst's perceptions of the impact of change on their role. The findings indicate that, although there were differences between the organisations, the technical orientation of the analysts was a constraint on change. This was reflected in their comments about how they saw themselves, the enjoyment they derived from the technically challenging nature of the work, etc. However, while the analyst's technical orientation may be a constraint on hybridisation, the organisational context may be a factor which limits their ability to broaden their role. In interviews, most of the analysts were keen to develop a closer relationship with users in the business areas but they felt that the structure and culture of the organisation, the control exercised by management, etc. impeded their ability to do so. The findings suggest, therefore, that the analysts' orientation may be a constraint on hybridisation but their ability to bring about change in their role is influenced by contextual factors.

In Chapters One and Two it was suggested that the career system could be an important force for change in roles. The BCS's report on hybrids, City University's report on changing role and skill requirements and other documents emphasise that developing hybrids requires changes in the career system (BCS, 1990; City University, 1991). The findings suggest that changes in the career system can help to foster hybrid competences but are not sufficient to turn technicians into hybrids. This may be because the career system is supported by, and reflects, the belief system in IS and the

wider organisation. If the belief system does not change, any changes in the career system, aimed at broadening the role of the analyst, may be undermined.

The findings of the research indicate that the longer a role has been established, the more difficult it is bring about change in it because the expectations regarding behaviour have become more fixed. It may be easier to create change when a role is new and expectations have yet to become firmly established. This was apparent from the comments of the business analysts at Companies B and D. They felt they had greater freedom to be innovative because the role was new and the organisation did not, as yet, know what to make of it. Even where a role is new, however, there may still be constraints on hybridisation. The business analysts at Company D and E felt that they were not carrying out "real" business analysis because managers and users still regarded them as systems analysts. It will be recalled that most of the business analysts had been promoted from the ranks of technical staff and were known within the organisation as technical professionals. Lack of change in the organisation's expectations of the analyst's role, and prejudice against technical professionals, may therefore limit the scope for change in roles.

The difficulty of changing expectations surrounding roles points to another conclusion that can be drawn from the findings - measures designed to introduce change in roles are unlikely to succeed if perceptions of the role do not change. There are numerous examples of this throughout the research but perhaps the clearest is the failure to establish an internal labour market at Company C. The market was introduced to stimulate mobility in IS, broaden the roles of IS professionals and give them more exposure to the business. The findings indicate that it did not

achieve these objectives because project managers were able to prevent valuable team members applying for jobs elsewhere. The difficulty of persuading the project managers to see the roles of team members differently and to co-operate with the changes, combined with other constraints, made it difficult to implement major changes that may have been a force for hybridisation in the analyst's role.

Where roles had become more broad based, the findings indicate that the changes within the organisation took place over a fairly long period of time. At Company B, the change programme had been planned and phased in over a period of five years. The timescale was shorter at Company D - eighteen months - but management expected it to be several years before the full effects would be felt (by which time yet more changes would have been set in train). The analysts at Company D understood that change would be a protracted process and stressed that they expected it to be many years before the old mindset disappeared. The finding that change in the roles of the analysts tended to occur over a fairly long period calls into question the idea that it is possible to develop hybrids quickly and points to an evolution rather than a revolution in roles.

Finally, the findings suggest that it may be difficult to "manage" change in roles. There are a number of reasons for this. One is that roles are influenced by a very wide variety of factors, many of which may be beyond the influence of individual managers. It is difficult for individual managers to directly influence events at the macro-environmental or sectoral level, for example. Change in roles is also difficult to manage because people may be reluctant to alter their expectations of a particular role or be unaware of the need to alter their expectations. The problems the business analysts from a technical background experienced developing

a "trusting" relationship with users in the business areas point to the difficulties of changing people's perceptions. While the actions of the analysts may have contributed to the problem, the research indicates that the organisation's perception of the IS department/division, the structure and culture of the organisation, etc. all constrained the scope for change. Since organisational change depends on changing the roles of staff, it is clearly important for management and analysts to be aware of the impediments to change.

7.3 The Theoretical Framework

This section critically evaluates the theoretical basis of the research and focuses particularly on the strengths and weaknesses of the models developed to explain the nature and processes of change in roles.

7.3.1 The use of contextualism, contingency theory, interpretivism, functionalism and General Systems Theory

The research drew on contextualism, contingency theory, interpretivism, functionalism and General Systems Theory. In Chapter One it was suggested that there was only one piece of research that had used a contextualist approach to explain change in the roles of IS professionals. In adopting a contextualist approach, therefore, the research contributes to a new, and potentially valuable, area of research IS. The findings generally support the use of contextualism to examine the nature and process of change in roles. There are numerous illustrations throughout the thesis of the advantages of the approach in highlighting the dynamics of the change process but perhaps the best example is the attempts of the business analysts at Company B to preserve their independent status. To

understand the motives behind their actions, and the implications for roles, it was necessary to understand the political agenda within the Development Section and the nature of the changes that had taken place within the organisation. The changes in the role and status of the business analysts was prompted partly by the desire to harness the business analysts' skills but also to prevent them from giving independent advice to users, thus undermining the position of the IS Department and its relations with the business areas. The tensions which existed between the different factions only became apparant because the investigation examined the context in which changes in the roles of the analysts occurred.

The use of contingency theory to explain the process of change in roles is also justified by the findings. It was shown that the organisations that took part in the research differed in a number of ways. Chapter Four described these differences in detail. Companies D and E, for example, both operated in the same market but differed in terms of their structure, culture, size, etc. Company D had almost twice as many staff as Company E and a radically different organisational structure. It is not perhaps surprising, therefore, that they responded in different ways to internal and external pressures for change and that the effects on roles reflected these differences. The finding that there were differences between the organisations in terms of the impact of change on roles, emphasises the importance of focussing on the features of the situation.

In addition to drawing on contingency theory, the research used an interpretivist approach in examining the process of change in roles. The aim of the latter was to uncover the perceptions and feelings of the analysts and other stakeholders. This was considered important because perception and feeling guides action. The way the main actors perceived

the situation would influence their orientation to their role and, through this, the process of organisational change. The results justify the adoption of this approach. By allowing the analysts to "speak for themselves" it was possible to gauge how those most affected by change felt about it and how this influenced their behaviour. A good illustration of this is the business analysts' reaction to their loss of status mentioned previously. The dynamics of this situation were only revealed by allowing the analysts and managers to explain the situation and their feelings about it.

General Systems Theory and Functionalism provided the main theoretical underpinning of the research. General Systems Theory, it will be recalled, suggests that organisations should be viewed holistically as systems composed of interrelated subsystems. The interrelationships between the various subsystems means that change in one part brings about change in other parts. Functionalism is also based on the idea that organisations can be viewed as systems but stresses that the various subsystems are bound together in a co-operative relationship which ensures the survival of the organisation. This is why any change that threatens the stability of the system will meet with resistance.

One of the criticisms of functionalism is that it does not cope well with dramatic change. It would not therefore be able to account for the changes that took place at the companies described in the research. However, the findings indicate that the "dramatic changes" that took place in the organisations typically occurred over a long period - several years in one company. There were also constraints on change in all the organisations which were related both to the difficultes of managing large-scale change and the strength of vested interests at all levels within the organisation. The existence of these constraints and the tensions which existed between

different parties within the organisation calls into question the notion that organisational subsystems co-exist in a co-operative relationship but it does not disprove the central idea that there are significant constraints on organisational change and change in roles.

7.3.2 Models of the Change Process

Four models were developed as part of the research to aid in interpreting the empirical findings. The first of these depicted the range of factors influencing the roles of IS Professionals; the second identified the forces in the inner context driving and constraining change in the roles of IS professionals; the third depicted the forces in the inner context driving and constraining hybridisation in the role of the systems analyst. The fourth identified forces in the macro-environment that were influencing the case study organisations. This section focuses on the first and third and models as these relate specifically to change in the analyst's role.

The Model of the Factors in the Inner and Outer Context that Influence the Roles of IS Professionals was useful in identifying the factors that influence roles. All the factors that were identified in the Model as having an influence on roles of the analysts helped to explain the impact of change. The different internal factors shown in the Model did influence the roles of the analysts and changes in the analyst's role did exert an influence on the organisation. Factors in the outer context do appear to influence the inner context. This occurs partly though the organisation's formal mechanisms for managing its relationship with the external environment and partly through changes of perception and attitudes brought about by events in the external environment.

The third model presented in the thesis - the Forces in the Inner Context Driving and Constraining Hybridisation in the Role of the Systems Analyst was also useful in interpreting the findings. All the factors identified as important could be used to illuminate the impact of change on roles. However, the model makes no distinction between the factors in terms of their significance in particular contexts or indicates how they may combine to influence the change process. Differences in the significance of particular factors, and the ways in which factors interacted to influence roles, were only revealed by examining the context in which the changes took place.

Some factors that might be considered crucial turned out to have less direct impact than expected. Changes in corporate strategy, for example, might be considered crucial because they create the context for organisational change and guide managerial decision-making. The case study findings suggest that, in reality, the situation is more complex. Firstly, the changes that were introduced in the IS department of the companies were not always a direct result of changes in corporate strategy. At Company B, strategy was being developed lower in the organisation and moving up. Secondly it often took a long time for changes at the corporate level to influence those at a lower level in the organisation. The actual implementation of the change was therefore sometimes different from what was originally intended. The existence of constraints within the organisations highlights the problems of implementing corporate (or IS strategy) and reinforces the importance of focussing on contextual factors.

Certain factors emerged as important from the data which had not been anticipated in the model. The personality and leadership style of the head

of IS or senior managers within IS, in particular, appeared to have an important influence on roles. When analysts discussed the impact of change on their role, it was clear that they were strongly influenced by the leadership style of the head of IS. The rather authoritarian style of senior management of the IS Function at Company A was highlighted as a major constraint on change. The more innovative leadership style at Company B and D produced a very different reaction. It will be recalled that one of the analysts at Company D enthused that senior managers welcomed creativity and were "crying out" for good ideas. Future studies of the impact of change on roles clearly need to take account of the personality and leadership style of the head of IS/senior management in IS.

7.3.3 The Dynamics of the Change Process

The theoretical propositions developed in the first part of the thesis also indicated the process by which change in roles comes about. It was suggested that (a) change occurs when the forces for change are greater than forces against it; (b) the individual and the career system are the principle mechanisms for effecting change in roles. The question arises of whether change in roles occurs in the way suggested.

With regard to the first point, the finding that none of the organisations had developed hybrid analysts and only two had broadened the analyst's role suggests that the forces against change were greater than the forces for it in most of the organisations, thus supporting the central contention that change in roles in the organisations concerned was the outcome of pressures for and against change. The fact that the organisations had all experienced "dramatic" change appears to contradict this idea, however. If the organisations had experienced genuinely "dramatic" change,

presumably, the forces for hybridisation would have been overwhelming in all the organisations. This argument takes the word "dramatic " much too literally. The changes at all the case study organisations took place over a long period of time and was constrained by a number of internal factors. Secondly, developing hybrid analysts was not high on every manager's agenda. Management at two of the organisations had a very ambivalent attitude to developing hybrid competences. Companies A and E wanted analysts who were technical specialists. Finally, had all roles become hybridised overnight, the organisations might have found it difficult to cope.

In terms of the mechanisms for effecting change in roles, the findings of the interviews with analysts suggest that the orientation of the individual and changes in the career system do influence the outcome of change in roles. It is clear from the analyst's comments about how they saw their role in the organisation, that their expectations of how they should behave was one of the factors that constrained the scope for hybridisation. It is equally clear, however, that the analyst's actions were constrained by the organisational context. Although the business analysts at Company D (the organisation that had experienced the most dramatic changes in a short period) did feel they had greater freedom to define their role, most of the analysts complained that the scope for role innovation was quite limited.

With regard to the career system, it was suggested that the organisation's policies for recruiting, training, assigning, appraising and promoting staff were instrumental in bringing about change. This is because these changes have the most direct impact on the individual and on the structure and culture of the IS department/division. In interviews, managers clearly saw the career system as a way of bringing about change in roles. Also, in

discussing the changes that had taken place in the organisation and their role, the analysts specifically referred to the career system. The introduction of resource pool system at Company B, for example, and the appointment of Resource Managers to monitor careers was identified by the analysts as a force for hybridisation. As suggested earlier, the findings indicate that the career system can be a force for hybridisation but its impact may be constrained by other factors within the organisation.

7.4 Methodological Considerations

The quality of the research depends on the methodology used to collect the data. It is important, therefore, to briefly reflect on the effectiveness of the methods used to collect the data. A combination of different techniques was used to investigate the research topic but the principle method employed was the case study. This was deemed to be most appropriate to the subject matter and was consistent with interpretivist/contextualist philosophy adopted in the research. The research findings suggest that the use of the method was justified as it was possible to collect a great deal of valuable information on the process of change in each of the organisations. The Questionnaire which was distributed to obtain background details on the analyst's career development, the interviews that were conducted with the analysts and other "stakeholders" and company literature provided rich insights into the context and process of organisational change and its effects on roles.

There were problems with the use of the case study method, however. Apart from the difficulties of obtaining quantitative data which have already been discussed in Chapter Three, the relatively large number of organisations studied meant that it was not possible to undertake the

detailed contextual analysis which would have been possible if just one or two organisations had been studied. This disadvantage was compensated for, however, by the advantages of using multiple, comparative case studies. The course of action that was adopted thus sought to obtain the benefits of using both contextualist and contingency approaches.

Another problem with the method of data collection used was the strong reliance placed on subjective assessments of change. Although the aim was to uncover the analysts' perceptions, it could be argued that the findings would inevitably be biased. An individual who has had good experiences within the organisation, for example, may be more positively motivated towards organisational change than someone who has not been treated well by the organisation. Personal prejudice might therefore influence the research findings. This particular problem was overcome in the research in a number of ways. Firstly, in discussions with management it was agreed that they would select people whose opinions would genuinely reflect the diversity of opinion held within the organisation. Secondly, it was possible to use professional judgement in interpreting comments and observations (this, of course, requires the researcher to be aware of their own prejudices). Thirdly, the research was concerned with issues of bias and it was entirely appropriate, therefore, that the analyst's negative reactions to change, and the reasons for this, should be reflected in the findings. If an individual or group of individuals hold a negative view of the change process, because they feel themselves to have been victims of it, it is important to identify this since it will affect the process of change in roles and is likely, in subtle ways, to affect the process of change in organisations.

Overall, although there were problems with the methodology selected, many of these were overcome or at least reduced by careful research design. The use of the case study method was well suited to the topic under investigation and provided important insights into the change process in organisations. While other methods could have been used, these would not have yielded information that was as rich or reflected the complex range of issues with which the research was concerned.

7.5 Implications for Theory and Research

In Chapter One it was suggested that there is very little empirical research on the factors influencing roles in IS, the impact of organisational change on roles or the dynamics of the change process. This thesis has attempted to organise existing knowledge about the factors that influence the way roles develop, presented a model of the dynamics of change in roles and examined the impact of change on the analyst's role in a number of organisations. More theory-building and research is needed, however, before it is possible to gauge the full impact of the effects of change on the roles of IS professionals.

The investigation described in this thesis suggests that an understanding of the change process requires the use of approaches and techniques which focus on the context. It follows that future research could usefully draw on interpretative/contextualist approaches to explore the process of change and its effects on roles in different contexts and over different periods of time. This would add to the body of knowledge in IS and complement more scientific/quantitative research.

With regard to the findings of the present investigation, more research is needed which examines the relationship between external and internal drivers of change identified in the Model of the Factors Influencing Roles. The present study has highlighted the role of organisational strategies for mediating external forces, such as technological change, but it has not examined the dynamics of this process in depth. As regard other external factors, further research is needed on the way in which the external supply of labour influences recruitment policies and the factors which determine the success or failure of attempts by the professional bodies and trade unions to influence individual and managerial decision-making.

Turning to internal factors, more research needs to be carried out on specific factors identified as important in the change process. The impact of the organisation's core business needs to be examined more thoroughly by conducting similar studies in different types of organisation. The present research was based in large, private sector organisations that have similar structural features. It would be useful to undertake a comparative analysis of the impact of change in public service organisations. While the drivers of change would be similar, because the context of change would be different, the findings should reveal substantial differences in terms of the effects of change on roles. Subsequent studies might seek to identify these differences and assess their implications for the management of change.

There would also be value in conducting research on roles in different sized organisations to develop a clearer understanding of the impact of size on roles. The present research controlled for size by focusing on the impact of change in large organisations. It would clearly be useful to conduct similar studies in smaller organisations. Further research also needs to be conducted on the impact of structure on roles. The research

controlled for structure by basing the investigation in centralised IS departments/divisions. The trend over the last few years, however, has been towards decentralisation. Comparative studies carried out in organisations with decentralised structures would provide additional insights into the impact of structural characteristics on roles.

The research suggests that corporate, IS and human resource strategies are important in establishing the context and direction of change. Very little is known, however, about how these different strategies combine to influence roles or the factors which determine their impact on roles other than what has been described in the pages of this thesis. Further research could address these issues by examining the impact of corporate, IS and human resource strategies in different types of organisation, the ways in which they influence the outcome of change in roles and any factors which limit the impact of strategies on roles in IS.

The importance of culture in influencing attitudes and behaviour was highlighted in the investigation but more research is needed on the relationship between organisational change, cultural change and change in roles. It would be particularly useful, for example, to develop a typology for describing cultural transitions within IS. One of the problems encountered in conducting interviews with analysts and managers during the investigation was the difficulty they experienced articulating salient features of the culture in IS. Research efforts need to focus on developing an appropriate vocabulary and on classifying cultures, which permit comparisons between different organisations. This would make it easier to analyse the effects of cultural change on roles.

The findings of the research indicate that leadership in IS and the actions of various groups within the organisation are important in influencing the scope for change in roles. Management, different occupational groups, the occupational community and professional bodies, etc. all influence the way roles develop and may act as forces for or against change. Future research could focus on specific groups and their influence on the change process. The findings of the research indicate that a key force for change in the systems analyst's role has been the emergence of business analysts as a separate occupational category. The business analysts were an ascendant group in two of the case study organisations and occupied a high status in the remaining organisations. Further research could examine the different strategies employed by analysts and managers to promote the business analysts within organisations; the career prospects associated with the role, etc.

The internal supply of labour was identified as a factor influencing change in roles. The research indicated that recruiting users from the business areas was a favoured option for injecting business awareness into the IS department/division. The results indicate, however, that there is a tendency for users to become socialised into the culture of IS and to lose their business edge. It would be useful to compare the roles of business analysts/user representatives in organisations that have incorporated them into the IS department/division and those which have located them in the business areas to assess the impact of these different strategies on roles.

The final internal factor influencing roles was deemed to be the attitudes, interests and skills of the analysts themselves. The research has shown that the latter can play a significant part in facilitating or impeding the

process of change but that the actions of individuals are often severely constrained by the organisational context. It would be very interesting, in light of this, to examine whether there are instances where analysts, or other IS professionals, are in a stronger position to influence their role and the factors which determine the relative importance of individual/ organisational factors.

The research examined the impact of change in financial service and retail companies and focused specifically on the roles of systems analysts. Although there were significant differences between the organisations, there were also many similarities. It would be instructive to carry out similar research in organisations that have a very different mission, e.g. public sector or voluntary organisations to see whether the mission of the organisation influences the nature and direction of change in roles. It would also be useful to examine the forces for or against hybridisation in the roles of different occupational groups, particularly those whose role has traditionally been very technically defined, e.g. programmers, network analysts, etc. and to determine whether there are consistent differences between organisations in the propensity to hybridise.

The present research examined the main means for effecting change in roles - the career system and the actions of individuals. Further research is needed on how the both facilitate or impede change. It would be particularly valuable to examine the career systems of organisations that are very different from the ones that took part in this research to see whether there are differences and, if so, whether they have been more or less successful in developing hybrids. As regards examining individuals as change agents, further research needs to be undertaken on how individuals bring about change in their roles, particularly in situations

where there is considerable opposition from certain factions within the organisations.

The research did not examine the relationship between changes in roles and organisational effectiveness. This is largely because it was of an exploratory nature and intended to identify relevant variables and possible relationships between them. Nevertheless, it is clearly of practical importance to know whether the changes brought about in roles as a result of organisational change contribute to organisational effectiveness. Future research could usefully explore this issue by examining whether changes in roles as a result of organisational change reflect management objectives and whether they have produced any measurable benefit. It is difficult to establish appropriate criteria for this type of research but it would be a valuable exercise since it would facilitate management planning.

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APPENDIX A
LETTERS SENT TO COMPANIES

Appendix A1 Copy of initial letter sent to Company

Appendix A2 Copy of letter confirming arrangements with Company

APPENDIX A1

27th February 1995

Dear Mr

I am writing to request your help in some research I am undertaking at Warwick University for a PhD on the role of the systems analyst.

As the enclosed Executive Summary indicates, I am particularly interested examining the impact of forces that are "driving" and "constraining" change in the analyst's role.

I have already completed an analysis of roles in three large organisations in the financial services sector and obtained some fascinating data on the implications of changing role and skill requirements for human resource management. I am now hoping to extend my research to cover organisations in the retail sector.

Since .... is one of the best known names in retailing and has an outstanding reputation for staff development, I was wondering whether you could possibly spare the time to discuss the ways in which you develop the skills of your systems staff.

I know you must be very busy but an interview need take no longer than an hour and could be conducted at any time to suit your schedule.

If hope you will not mind if I telephone next week to discuss this matter with you further.

Yours sincerely

Valerie Flynn
Enc.

APPENDIX A2

25th April 1995

Dear Ms -

Thank you very much for sparing the time on Monday to discuss my research on the role of, the systems analyst. I now have a much clearer idea of the organisational changes that have taken place at ... and the initiatives you have introduced to broaden the roles of systems staff.

I must also thank you for taking the trouble to find out whether it would be possible for me to interview some members of staff. As I explained during our conversation, I would need to speak to seven people who carry out what the organisation deems to be the systems analyst's role.

With regard to the arrangements for the research, each volunteer would need to complete a questionnaire which provides details of their background and career development. A copy is enclosed for your information. The results would form the basis of a semi-structured interview lasting approximately ninety minutes. The interviews could be conducted at any time to suit the convenience of staff. Once I had completed all the interviews, I would need to speak to a manager in IS to obtain management's perception of the changes that have taken place in the organisation and their impact on roles.

The results will be written up as part of an 80,000 word doctoral thesis on forces that are driving and restraining change in the role of the systems analyst. The thesis is intended not only to contribute to the academic literature on roles in IS but also to be of practical value in guiding human resource decisions on management development issues.

The names of the organisations that take part in the research, and the analysts who volunteer, will not be revealed. While I would like to publish at least part of my findings, this will not be without the prior approval of those concerned. A copy of the manuscript will, of course, be sent to you for your information.

Finally, I do hope that you can persuade management to agree to take part in the research. I am sure that you would find the results of benefit both in providing feedback about how staff have reacted to changes in policy and in guiding human resource decisions.

Thank you once again for helping me with my research.

Yours sincerely

Valerie Flynn

Enc.

APPENDIX B
EXECUTIVE SUMMARY

Appendix B1 Copy of Executive Summary sent to companies

APPENDIX B1

A Research Proposal on Factors Driving and Constraining Change in the Systems Analyst's Role

Executive Summary

Prepared by: Valerie Flynn

INTRODUCTION

Systems analysts are evolving into business analysts. This is the conclusion of a number of writers who argue that advances in information technology (IT) and the growing strategic importance of information are transforming the roles and skills of systems staff. Konstadt (1991), for example, observes that in their new role as business analysts, systems staff are now "active participants in the problem the business is trying to solve". Senese (1993) suggests that the new style business analyst "knows and does things that no programmer/analyst ever did".

The assumption underlying this argument is that the pace of change has been so rapid over the last few years that traditional occupational boundaries are breaking down. As a result, systems and business analysts' roles are converging in much the same way that the programmer/analyst roles began to converge in the late 1980's (Friedman and Cornford, 1989). While the information systems (IS) literature generally supports this view, there is little empirical evidence to indicate the direction and extent of change. Most of the research on changing roles and skills discusses general trends in the industry and does not examine the impact of change on specific occupational groups.

The research outlined in the next few pages redresses this imbalance by focusing on the impact of organisational change on the roles of systems analysts in selected organisations. It will examine the forces driving and constraining change in the analyst's role using a model of the change process based on Lewin's[56] work on change management. The results will provide a unique insight into the factors that are shaping the analyst's role and provide a tool which will enable organisations to determine the forces that may be blocking or limiting the scope for change.

SUMMARY OF AIMS

1. To examine the impact of organisational change on the roles of systems analysts

2. To identify whether there are any constraints on change in the roles of the analysts.

[56]Lewin, K. Group Decision-Making and Social Change, in G. E. Swanson, T. M. Newcomb and E. L. Hartlett (eds), *Readings in Social Psychology* (rev. ed.) Holt, New York. 1952.

KEY OBJECTIVES

The research sets out to answer the following questions:

1. What is the scope and content of the analysts' roles in each of the organisations studied?

2. What do the organisations want their analysts to be able to do now that they did not have to do a few years ago?

3. What skills do the analysts now need to be able to carry out their role effectively?

4. What is the analysts' subjective interpretation of the changes that have taken place in the organisation and the effect of these changes on their role?

5. What forces within the organisation are "driving" change in the analysts' roles and what forces are "constraining" change?

6. How can organisations successfully bring about changes in the analyst's role?

7. What are the practical limitations on change?

BUSINESS BENEFITS

There are a number of practical business benefits in the research described above. Firstly, it will clarify some of the forces that may be inhibiting changes in the roles and skills of systems analysts. These forces may be related to the use of particular technologies, the availability of certain skills; the structure and culture of the organisation, existing boundaries between roles; existing career structures or the interests and abilities of the analysts themselves. The research will help to identify what factors are important in the situation and suggests ways in which the organisation can overcome some of the factors that are blocking change.

Secondly, because the research will draw heavily on the analysts' own perceptions of the change process, it will provide valuable feedback on how they perceive the changes that are taking place in the organisation and the ways in which this is influencing their role.

Finally, the research will highlight some of the practical constraints on change. It will help to determine what can reasonably be achieved in a particular organisational context and highlight areas where it is important that continuity in roles and skills is maintained.

METHODOLOGY

1. Conduct a literature review of changing role and skill requirements in IS.

2. Develop a model of the change process which will incorporate forces driving and constraining change in the analyst's role.

3. Contact a number of organisations operating in the same sector to request their co-operation in carrying out the research. The organisations should be comparable in terms of the number of IS professionals employed and the nature of the task environment.

4. Obtain information on the organisations selected. The information should include (a) the nature of the product or service; (b) the market addressed; (c) structure and culture of the organisation; (d) structure and operation of the IS function; (e) key changes that have taken place in the management of IS over the last few years; (f) anticipated changes in the use of IT; (g) implications of these changes for roles and skills of systems analysts; (h) changes in procedures for recruiting and developing analysts.

5. Request managers to provide a sample of seven systems analysts to interview. The sample should be "representative" of the systems analyst population.

6. Ask sample to complete a short questionnaire on their roles and career history.

6. Interview sample to obtain data on (a) scope and content of their role; (b) skills needed to carry out their role; (c) their perception of the changes that have taken place in the organisation and the impact of these changes on their role.

7. Use the data from the questionnaires and interviews to (a) develop a profile of roles and skills across different organisations in the same sector and between sectors (b) determine whether the factors "driving" and "constraining" change in the analyst's role, identified in the model, can be verified empirically.

8. Assess implications of findings for organisations involved in the research.

CONCLUSION

The research described in this Summary offers a unique opportunity to examine how organisational changes have impacted on the roles of systems analysts, one the of largest and most important occupational groups in IS. The insights it will provide into changing role and skill requirements and the factors that are driving and constraining the change process, will help to fill an important gap in the IS management literature and be of practical value to the organisations that participate.

Address for Correspondence:

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APPENDIX C
QUESTIONNAIRE AND INTERVIEW SCHEDULES

Appendix C1 Interview schedule used in interviews with managers

Appendix C2 Copy of Career Development Questionnaire

Appendix C2 Interview Schedule used in interviews with analysts

APPENDIX C1

INTERVIEW SCHEDULE

Background Information on the Organisation

Interviewee's Personal Details

Name:	**Length of Tenure:**
Position:	**Date on Interview:**
Department/ Division	

Section One: The IS Function

1. How many IS professionals do you employ?

2. How many systems analysts do you employ?

3. How is the IS Function organised, e,g. centralised, decentralised, federated?

4. How is work currently organised in IS, e.g. on the basis of project teams?

5. Has the structure of IS Function changed in the time that you have been here?

   Yes ...

   No ...

   If the answer is yes, in what way has the structure changed?

6. What sort of systems are you using?

7. What systems will you be using in future?

8. How would you describe the culture of IS Function?

9. What is the most senior post in IS?

10. Is the most senior position in IS filled by someone from a business or a technical background?

11. Have there been any significant changes in management in IS over the last few years?

    Yes ...

    No ...

    If the answer is yes, can you describe these changes?

12. Have there been any significant changes in human resource policy in the IS Function over the last five years?

Yes ...

No ...

If the answer is yes, can you describe these changes?

13. How has the IS Function's role changed in relation to the business during the last few years?

14. How do users view the IS Function?

15. Have users' perceptions of the IS Function changed in the last five years?

Yes ...

No ...

If the answer is yes, can you describe these changes?

16. What will the IS Function within the Company Look like in five years' time?

Section 2: Systems Analysts

17. How would you define a systems analyst?

18. Do you differentiate systems analysts from business analysts?

    Yes...

    No ...

    If the answer is yes, what criteria do you use to distinguish them?

19. Can you describe the range of tasks and responsibilities of a "typical" systems analyst?

20. What competences are needed to carry out the systems analyst's role within the Company?

21. When you recruit systems analysts, what qualities or skills do you look for?

22. How do you go about ensuring that systems staff understand the information requirements of the business?

23. What training do systems analysts receive?

24. Do you recruit systems analysts internally from the business areas?

Yes ...

No ...

25. Do systems analysts move out of the IS Function to take up positions in the business areas?

Yes ...

No ...

26. How, in your view, has the role of the systems analyst changed within the organisation in the last few years?

27. Do you envisage any changes in the systems analysts role within the Company in the five years?

Yes ...

No ...

If the answer is yes, can you describe these changes?

28. Can you describe the career grading structure within the IS Function?

29. Do you have a grow your own philosophy or would you recruit externally?

Section Three: The Company

30. What have been the main business problems facing the organisation in the last few years?

31. Would you describe users as knowledgeable about IT?

Yes ...

No ...

32. Do you think the culture of the organisation has changed over the last five years?

Yes ...

No ...

If "yes" can you describe these changes?

APPENDIX C2

Questionnaire on Employee Career Development

The aim of this questionnaire is to obtain background details regarding your education and main career moves. The information provided will highlight some of the factors which have influenced your career development and will form the basis of a subsequent interview.

All answers will be treated in the *strictest confidence.*

Please respond in the space provided.

Section A: Personal Details:

Name of respondent: .....

Name of organisation: .....

Position: .....

Length of tenure in present organisation: ..... Years ..... Months

Section B: Educational Background

1. Do you have a degree?

Yes ...

No ...

If the answer is "yes", could you please state in which discipline.

2. Do you have a postgraduate qualification, eg. MSc., MBA?

Yes ...

No...

If the answer is "yes", could you please state main area or discipline.

3. Do you hold any professional qualifications?

Yes ...

No ...

If the answer is "yes", could you please state in which area. .....

Section C: Career Moves to Date:

4. Could you please list your main career moves before you joined your present employer.

Dates	Name of organisation	Job title	Main duties

5. Could you please list your main career moves with your present employer, beginning with your first position in the organisation.

Dates	Job title	Main duties & responsibilities

Section D: Training

6. Have you received formal training while working for your present employer?

Yes ...

No ...

If the answer is 'yes' has this training been in any of the following areas:

Systems analysis ...
People management skills ...
Project management skills ...
Other business areas, ...
e.g. marketing, finance

Section E: The Future

7. What position *would you like* to occupy in five years'time?

.....

8. What, if anything, *do you think* will prevent you from achieving this goal?

.....

.....

Thank you very much for your co-operation in completing this questionnaire.

Val Flynn

APPENDIX C3

INTERVIEW SCHEDULE

EMPLOYEE ROLES AND CAREER DEVELOPMENT

Personal Details

Name of Interviewee:	*Date of Interview:*
Department/Division:	
Length of Tenure:	
Date of Birth:	

Section One: Recruitment/Early Days

1. How were you recruited into the organisation, e.g. by interview, aptitude tests?

2. When you were recruited into the organisation, what skills and abilities do you think the organisation was looking for?

3. Did your first position with the organisation entail any programming?

Yes ...

No ...

If the answer is "no" can you please describe the type of tasks and duties you carried out.

Section Two: Background on Current Area

4. Can you tell me about the area in which you are working? How is it structured/organised?

5. How is work allocated to you?

6. Who do you report to?

Section Three: Content and Scope of Role

7. What are you working on at the moment?

8. Do you have any responsibility for staff?

Yes ...

No ...

If "yes", how many people report to you?

9. Do you have discretion over how you carry out your work?

Yes ...

No ...

10. Could you do your job without some general business experience?

Yes ...

No ...

11. Do you need an understanding of your employer's business to carry out your role?

Yes ...

No ...

If the answer is "yes", how do you go about acquiring that understanding in this organisation?

12. Has your role changed in the time you have worked for your present employer?

Yes ...

No ...

If the answer is "yes", how has your role changed?

13. What are the main skills you need to carry out your present role?

14. Which of the following terms best describes you:

A computer professional ...

A hybrid ...

A business executive ...

A technical specialist ...

15. How do you see your role developing?

Section Four: Staff Development

16. How do you go about getting training in this organisation?

17. Has the training you have received prepared you for your present role

Yes ...

No ...

If the answer is "no", what training would help you to carry out your role more effectively?

18. Are you appraised?

Yes ...

No ...

If the answer is "yes", what do you see as the objectives of appraisal in your organisation?

Section Five: Career Development

19. How do you find out about career openings at the organisation?

20. Would you, in future, want to move into a job out of the IS function?

Yes ...

No ...

21. Is there anything that would prevent you moving to another area of the business?

Yes ...

No ...

If the answer is "yes", please elaborate:

22. What qualities or abilities are important in getting on in the organisation?

23. Who has most influence over your career?

Section Six: Career Orientation

24. What aspects of your job do you find most interesting?

25. What do you find most satisfying about your job?

26. What do you find least satisfying about your job?

Section Seven: The IS Function

27. How would you describe the culture of organisation?

28. How would you describe the culture of the IS function?

29. Has the culture of the IS Function changed in the time that you have worked for the organisation?

Yes ...

No ...

If the answer is "yes", please describe these changes.

30. How do you think the IS Function is perceived in the organisation?

31. What do you think the IS Function will look like in 5 years'time?

APPENDIX D
FEEDBACK ON FIELDWORK

Appendix D1 Copy of confirmation note sent to analysts

APPENDIX D1

REPORT ON COMPANY ....

Thank you for reading the report.

I would be very grateful if you could answer the following questions:

1. Are you satisfied that you cannot be identified from the document?

Yes .... No ....

If the answer is no, can you please indicate how you would like the report to be amended to ensure your anonymity:

---

2. Do you feel that I have represented your views accurately and fairly?

Yes .... No ....

If the answer is no, can you please suggest what changes ought to be made to the document:

Thank you

Valerie Flynn