THE EVOLVING ROLE OF INFORMATION SPECIALISTS: CHANGE AGENTS IN PROCESS REDESIGN

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This research investigates the past, present and potential future role of Information Specialists (ISps) in process oriented companies. It tests the proposition that ISps in companies that have undertaken formal process reengineering exercises are likely to become more proactive and more business oriented (as opposed to technically oriented) than they had previously been when their organisations were organised along traditional, functional lines.

A review of existing literature in the area of Business Process Reengineering and Information Management reveals a lack of consensus amongst researchers concerning the appropriate role for ISps during and after BPR. Opinion is divided as to whether IS professionals should reactively support BPR or whether IT/IS developments should be driving these initiatives.

A questionnaire based 'Descriptive Survey' with 60 respondents is used as a first stage of primary data gathering. This is followed by follow-up interviews with 20 of the participating organisations to gather further information on their experiences. The final stage of data collection consists of further in-depth interviews with four case study companies to provide an even richer picture of their experiences.

The results of the questionnaire are analysed and displayed in the form of simple means, frequencies and bar graphs. The 'NU-DIST' computer based discourse analysis package was tried in relation to summarising the interview findings, but this proved cumbersome and a visual collation method is preferred.

Overall, the researcher contends that the supposition outlined above is proven, and she concludes the research by suggesting the implications of these findings. In particular she offers a 'Framework for Understanding and Action' which is deemed to be relevant to both practitioners and future researchers.

Key words/phrases: Information Management; Information Systems; Information Specialists; Business Process Reengineering.

In memory of my father Esfandiar Roushanbakhti

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Literature Search and Research Focus

1.1 INTRODUCTION

Following Organisation and Methods work studies (O&M), Total Quality Management (TQM) and Continuous Improvement Programs (CIP) Business Process Reengineering (BPR) became popular with managers in the 1990s. Some authors referred to BPR as 'core process redesign' (Hagel *et al* 1993) and others as 'process innovation' (Davenport 1993). In general, however, it may be stated that BPR is the method by which companies fundamentally change the ways that they are organised and do business in order to experience performance gains.

In the last decades of the 20th century businesses have been forced to respond to increasing change imperatives imposed by numerous macro and micro environmental factors. These drivers of change included: growing developments in technology, new ways of working, more sophisticated customers, globalisation, changes in transportation, quicker time-to-market, new quicker and leaner competitors, escalating costs, greater stock market and shareholder pressure, and more mergers and acquisitions. As competition increased businesses looked for an holistic approach to strategy formulation. Critical measures of performance, such as costs, cycle times, time to market, responsiveness, quality and customer satisfaction came to the fore in many business.

In addition, the global nature of competition reduced the role of geography and international boundaries in commerce and required businesses to compete in a global environment. By the late 1990s Turner (1998) argued that the very nature of competition had changed. He reasoned that it was no longer sufficient for businesses to compete on factors such as being a low cost supplier but argued that it was the speed of organisational responsiveness to opportunities and threats that was important.

These increasing competitive pressures had resulted in increased customer choice and increasing customer expectations. Therefore, businesses had to become more responsive to the needs of their marketplace in order to retain and attract more customers. Hence the focus on O&M, TQM, CIP and eventually BPR was inevitable.

The phenomenon of organisational change has been examined from various viewpoints during the last decade. Marcredie and Sandom (1999) stated that the "requirement for an organisation to change is generally caused by changes in its environmental variables which may be political, economic, social or technical". Some (e.g. Pettigrew 1998) regarded competitiveness as an innovation contest and suggested that unless organisations became less bureaucratic and more flexible they would lose the business contest.

Turban et al (1997) emphasised that "organisations need to be more responsive than ever to customers to succeed in today's environment".

Within the general discussion on change management Business Process Re-engineering (BPR) was seen as worthy of a great deal of attention as it was used to help organisations confront and handle challenges in an increasingly competitive market (Hammer & Champy 1993).

Hall *et al* (1993) found that to be effective the redesign must "penetrate to the company's core", fundamentally changing six crucial organisational elements, or "depth levers":

- Roles and responsibilities;
- Measurements and incentives ;
- Organisational structure;
- Information technology;
- Shared values;
- Skills.

Hall *et al*'s (1993) findings further indicated that "companies that manipulate all six depth levers to bring about behavioural change show the most dramatic process-cost reduction", and agree with Hammer's (1990) views on starting with a 'clean slate'. "If the redesign plans are sufficiently broad, all the old support systems will become obsolete - from IT systems to employee skills".

As regards the first of Hall et al's elements, they postulated that this type of substantial organisational restructuring would result in some form of *individual* role transformation in order for the change initiative to be effective across the organisation.

Johansson et al (1994) further speculated on the likely roles of individuals in a process oriented organisations:
"Individuals in the process-oriented organisation will be able to work comfortably in teams because they will have been given the right tools to function that way. They will have broadened skills, including analytical and interpersonal skills, a commonality of language across the organisation, an appreciation of each others needs, and a better understanding of how things fit together. They will be linked by common values, and be highly motivated."

In addition, Balle (1995) suggested that "...people's roles change from 'controlled to empowered'" and "as management invests teams with the responsibility of completing entire processes, it also needs to give them the authority to make the appropriate decisions and commitments." In a similar vein, Mumford *et al* (1994) speculated that "successful change, particularly if it large scale or dramatic, requires mutual shared values and mutual understanding". They continue to argue that "commitment to change requires that employees at every level must know and understand the vision of the future that is being striven for. They must appreciate and approve what is involved and how they can personally contribute. Commitment to change is greatly assisted by accurate communication and free and open discussion."

More recent literature has tended to confirm these comments and suggested that, as far as individuals' roles are concerned, reengineering "has improved the jobs of employees, giving them more authority and a clearer view of how their work fits into the operations of the enterprise as a whole" Hammer *et al* (1999).

Another of the key organisational elements identified by Hall et al (1993) was Information Technology. Later O'Brien (1999) affirmed that "we are living in an emerging global information society, with a global economy that is increasingly dependent on the creation, management, and distribution of information resources

over interconnected global networks like the Internet". He therefore, suggested that "information is a basic resource in today's society" (O'Brien 1999) and that in undertaking organisational change vigilant consideration of information resources is required.

It was with the thoughts of Hall and O'Brien in mind that the thinking behind the need for this research developed. The author became increasingly interested in the use of information and information systems within BPR initiatives, and realised that there was no in-depth analysis available as to the role that Information Specialist (ISp) might be able to play in contributing to these types of fundamental change programmes.

There was also no model or framework in place to guide organisations in the most effective use of the ISps in order to capitalise on the key skills that the ISp possesses to support the change programme and effectively contribute to BPR programmes. It has therefore been the aim of this work to create this missing framework based on an examination of the knowledge and experience of practitioners who have undertaken major BPR programmes.

BPR programmes can be lengthy, rigorous and complex, and the author's increasing awareness of the potential contribution of the ISp led to the goal of this research - to create this missing framework based on an examination of the knowledge and experience of practitioners. The definition of a framework in the context of this research is a model or "road map" which can be used as a guide to enable subsequent organisations to achieve greater success from similar change programmes.

The diagram below illustrates the approach to and overall design of the research.

Aim of Research: ***To create a framework based on an examination of the knowledge and experience of practitioners who have undertaken major BPR initiatives, in order to guide organisations in the most effective use of the ISp in BPR programmes.***

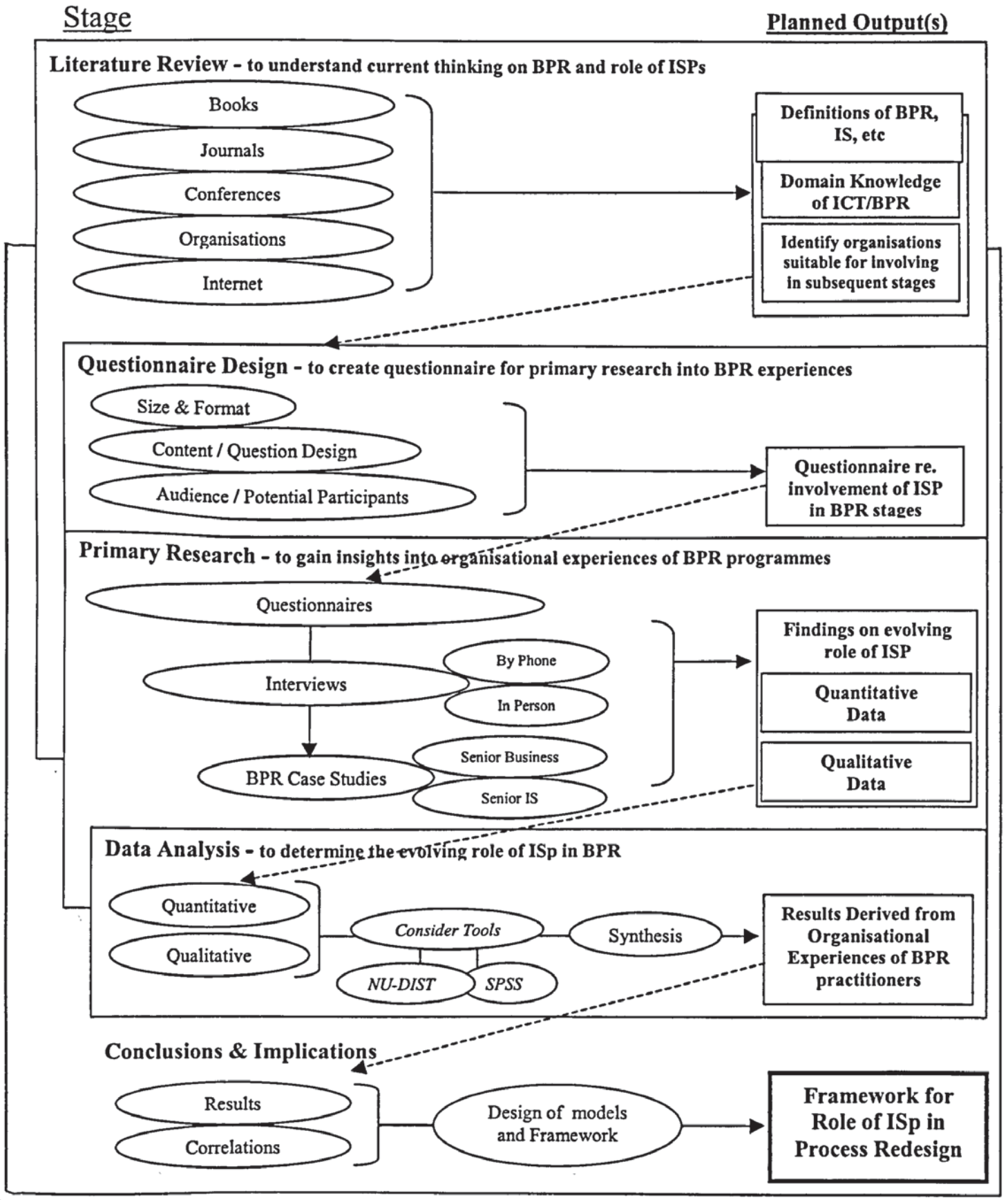

Figure 1.1 Research Design

The remainder of this thesis is structured as follows:

The rest of Chapter One details the literature review and research scope and proposition, investigating the current literature to develop discussions on the impact of change on today's businesses. The focus of the discussion is placed on the theory of BPR and the role of IT/IS and ISp in BPR. The observation is made that the appropriate role of the ISp during a BPR programme is an area worthy of further investigation.

Chapter Two involves a discussion of the research philosophy and implementation design, illustrating the choices available to the researcher and justifying the rationale for the approaches selected.

Chapter Three presents an analysis of the findings obtained from the first stage of the primary research in which a questionnaire approach was used.

Chapter Four presents the findings of the subsequent follow-up interviews undertaken with a sub-set of the respondents to the questionnaire. These interviews, using the same group categories as in the questionnaire analysis, discussed the role of the ISp before, during and after BPR, as well as inviting the participants to conjecture on the anticipated future role that the ISp might play.

Chapter Five details the case study approach used, involving in-depth interviews with senior IS professionals and senior user-area professionals who had been involved in each target organisation's BPR work. These interviews gave the researcher a deeper insight into the BPR initiatives undertaken and the role that ISps had played from the perspective of IS- and user-area-professionals.

Having presented the findings of the research in detail in Chapters Three, Four and Five, Chapter Six draws together the key findings, suggesting changing roles and changing skill requirements for ISps. In addition, as originally set out in the planning of this research, a framework is created which it is suggested may be used by companies when considering the future use of ISps within their organisational change initiatives.

1.2 CHAPTER SUMMARY

This chapter reviews research material available on Business Process Reengineering (BPR), and examines areas considered in the literature to be critical to the success of BPR programmes. In particular, the role of Information Technology (IT) in BPR initiatives is discussed. It has been suggested by many researchers that IT can play a very important role in BPR, but that organisational strategy and business needs should lead a major change programme such as BPR, with IT assuming an enabling, perhaps subordinate role in these initiatives.

The evolving role of the IT function within companies is reviewed, as is the dependence of new business process architectures on the IT / Information Systems (IS) infrastructure and solutions which support them. The observation is made that the appropriate role of the individual Information Specialist (ISp) during a BPR programme is an area worthy of further investigation. There is no model or framework in place to guide organisations in the most effective use of the ISps and capitalise on the key skills that the ISp possesses to support the change programme.

This research aims to fill this gap by providing an empirical, in-depth analysis of the role of ISps in a number of BPR initiatives and suggesting that the appropriate role of the Information Specialist in Business Process Reengineering initiatives is that of proactive and fully involved catalyst for change rather than reactive technical consultant.

1.3 DEFINITIONS USED FOR THE PURPOSES OF THIS RESEARCH

This research references a number of terms used in the existing literature concerning Business Process Reengineering and Information Technology. One of the problems with this evolving area of study, however, is the lack of standard terminology within the literature. For example, the terms Information Technology, Information Systems and Information Management (IM) are often used differently by different authors, and sometimes even interchangeably by a single author, depending on context.

For the purpose of clarity, therefore, it should be noted that the current author has used the following definitions within this thesis:

Information Management (IM): The discipline of establishing the information requirements of an organisation and the planning, gathering, storage, processing, retrieval and dissemination of that information as an aid to the effective and efficient running of the organisation.

Information Systems (IS): The software infrastructure that processes information to control and inform business decisions and activities.

Information Technology (IT): The technology used to acquire, process, store and retrieve information.

Information Technology/Information Systems Department (IT/IS Dpt.): The organisational entity (if any) with special responsibility for IT/IS.

Information Specialists (ISps): The individuals employed to provide professional expertise in delivering solutions to corporate information needs.

Business Process Reengineering (BPR): A major change programme which realigns an organisation in terms of its core processes rather than its functions, in order to experience quantum leaps in critical measures of performance, such as costs, cycle times, time to market, responsiveness, quality and customer satisfaction.

Business Process (BP): A set of related activities undertaken to carry out a task within a business.

1.4 THE CHANGING BUSINESS ENVIRONMENT

This research began at a time when much of the Western world was recovering from an economic recession. Organisations were striving for new ways to recover and grow, or at least to survive. Both academia and the business world were reviewing the results of "The Corporation of the 1990's" research (Michael S. Scott Morton (ed.) 1989). Morton et al had outlined the challenges to be faced by organisations in the new decade and identified various dimensions to organisational change. They had noted the likely impact of new technology on the way businesses were to perform in the next decade, and in particular had articulated the need for a focused corporate strategy and a new corporate vision capable of responding to an ever changing business environment.

As predicted by Morton et al, the 1990s saw businesses forced to respond to accelerating rates of change imposed by numerous macro and micro environmental factors. These have included: developments in technology leading to new ways of working; more sophisticated customers demanding shorter time-to-market product development cycles; globalisation and new, quicker and leaner competitors; greater stock market and shareholder attention to company performance, resulting in downsizing, cost controls, mergers and acquisitions. New critical measures of performance have come to the fore, such as cycle times, responsiveness, and quality and customer satisfaction measurement systems.

These increasing competitive pressures have resulted in increased customer choice and increasing customer expectations. Therefore, businesses have had to become more responsive to the needs of their marketplace in order to retain and attract more customers.

Increasingly, businesses have had to offer tailor-made services, regardless of their industry or whether, for example, they provide financial services, manufacture cars or do both. In addition, customers are more educated in their needs and are more aware of the processes involved in providing a service. Organisations need to be more responsive to customers than ever before to succeed in today's environment, and have increasingly been using approaches to increase customer loyalty in the ever more competitive business environment (Stalk & Hout 1990). Many organisations have also adopted technology as a tool "to help to open up a much broader range of functions to customers, for example allowing customers to specify products or view progress in delivery" (Stone 1999).

As early as 1985 Porter predicted the emergence of this increasingly volatile business environment (Porter 1985). As increasing numbers of businesses came to compete in the same market, new market entrants would threaten established market leaders. He suggested that in these circumstances the key to success was "flexibility", the ability to respond to the ever-changing business environment through informed decision making. At about the same time, Drucker's vision of the future in organisations included shrinking of management hierarchies, increased use of task–oriented working teams, increasing collaboration between and across traditional functions and

clearly communicated organisational direction (Drucker 1988). Nolan et al also predicted these steps as business visionaries began to recognise the need for change in the face of the competitive challenges of globalisation, and looked to create a flexible and responsive organisation. Businesses were advised to go beyond simple modifications of current bureaucratic hierarchies or risk "falling short of becoming globally cost-competitive, market-driven, or achieving a lasting competitive advantage" (Nolan et al 1988).

For other authors "innovation" was proposed as the critical survival tool in the increasingly competitive business environment. Innovativeness was the key factor required for responding to external pressure, and organisations needed to cultivate innovation in an effort to be more responsive. The need for organisations to become increasingly innovative becomes even more relevant as traditional core competencies of an organisation are seen as only temporary measures in an intensively competitive and continuously changing business environment. (Mumford et al 1975; Tapscott and Caston 1993). As a result of this increasing awareness of the need to become more innovative, organisations began to identify and emulate the characteristics of innovative organisations, behaving in many ways like a small entrepreneurial venture company, whilst taking advantage of benefits of size. This form of innovation and experimentation helped challenge traditional working practices and organisational structures and was used to help break through traditional barriers to flexibility (Mumford et al 1994; Twiss et al 1998).

It was within this context of a search for flexibility within an innovative culture that Business Process Re-engineering (BPR) began to receive a great deal of attention in both the academic and professional business literature (Davenport & Short 1990; Hammer & Champy, 1993), and a number of large organisations began to experiment with BPR initiatives.

1.5 BUSINESS PROCESS REENGINEERING

Following Total Quality Management (TQM) and Continuous Improvement Programs (CIP), Business Process Reengineering (BPR) became a popular management concept in the early 1990s. Referred to by some as 'core process redesign' (Hagel *et al* 1993)

and 'process innovation' (Davenport 1993), BPR is the method by which companies fundamentally change the ways that they are organised and by which they do business in order to experience performance gains.

Business process orientation significantly changes the focus of management in leading edge companies from an internal to an external focus, moving them beyond the limitations of their existing organisation boundaries to reinterpret the needs of their final beneficiary, the customer. During BPR businesses revisit the way they organised themselves internally in order to respond to the changing business environment and customer demand.

Michael Hammer noted that "work structures and processes have not kept up with the changes in technology, demographics and business objectives". Suggesting that organisational structures, pre-BPR, were based on the foundations of the early 1900's, at the time of industrial revolution, and had little relevance to organisations of the twenty first century's technology oriented working environment. He described BPR as "[breaking] away from the old rules about how we organise and conduct business", and suggested "looking at the fundamental processes of the business from a cross-functional perspectives". He advocated that organisations must redesign around their core processes rather than functions to achieve "quantum leaps in performance" (Hammer 1990).

The work of Frederick Taylor, early in the last century, revolutionised the workplace with his ideas on the organisation of work, the decomposition of tasks and measurement of jobs, known as 'industrial engineering' or 'scientific management' (Davenport and Short 1990; Taylor 1947). However, with the market pressures of the 1990's, two new tools were used to transform organisations, namely information technology and, more recently, business process reengineering. Whereas Taylor could focus on a stable business environment, the corporations of 1990's were not in that position. They needed to change the way that they were organised, with cross-functional teamworking and co-ordinated activities now being increasingly required (Davenport and Short 1990).

Hammer and Champy have said that BPR means "starting over", and define BPR as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as costs, quality, service and speed." (Hammer and Champy, 1993). The key message of this definition is one of having to break away from the traditional organisational hierarchies that are seen as a threat to the flexibility needed in a changing business environment. Davenport and Short advocate a similar perspective of BPR with the focus on redesigning and reengineering of processes and workflows to help maximise business effectiveness. For them BPR is "a revolutionary change in perspective", which amounts to "turning the organisation on its head, or at least on its side" and therefore, an organisation that cannot come to terms with what a process is cannot reengineer. Processes are "a structured, measured set of activities designed to produce a specified output for a particular customer or market", and taking a process approach implies adopting the "customer's point of view (Davenport and Short 1990; Davenport 1993).

The significance of process thinking is that it enables a set of related procedures to come together with a common aim of meeting the customers' eventual need. This coming together of various elements of the organisation emphasises the significance of crossing interrelated organisational boundaries to achieve process-specific tasks. This is demonstrated with one of the original models to illustrate the cross-functional process approach by Davenport, who illustrates (Figure 1.2) the integration between the key functional activities involved in New Product Development.

Figure 1.2 A Typical Cross-Functional Process (Davenport 1993)

Here, the 'New Product Development' process crosses three traditional boundaries on its way from market research to new product prototype. BPR enhances and streamlines the process so that the functional boundaries of old are no longer restricting.

According to protagonists of BPR, traditional organisational structures are no longer appropriate to the needs for a more dynamic working environment that will be more flexible and responsive to the demands and pressures from the market place. Functional inefficiencies and a lack of a process view lead to an expansion of organisational hierarchies, thus encouraging delays in ranks and authorities of communication. New organisational structures and designs are needed to respond to an ever-changing business environment. BPR has been characterised as improving a chain of activities that cross traditional organisational boundaries. Accordingly organisations have been redesigning around their core processes and ignoring previously separate functional departments or organisational boundaries. BPR enables the interfaces between these functional units be either improved or eliminated. It is suggested that it is the rethinking and reviewing of working practices that has helped organisations to re-value their key business performance elements, focusing the organisation's understanding of its strengths and therefore increasing the potential for exploring any opportunities more effectively.

Early research reflects this belief, suggesting the main reasons for companies embracing BPR include the provision of cross functional data to business units, operational cost reduction through process simplification, new sales generation based on better connectivity to customers, improvement of order fulfilment and speeding up of response times to customer enquiries (Bluestein & Hill 1993; Balle 1995; Hewitt & Yeon 1996). A survey of Fortune 1000 companies (Bluestein and Hill 1993), recorded some early examples of companies experiencing major improvements in their business operations through BPR. These included a forest products company that increased sales to its largest account 40%, a life insurance company that reduced the number of its claims offices from 60 to less than 25, and a computer company that reduced the cycle time of its order management system from 170 days to delivery to only 80 days. Other process oriented success stories included the Ford Motor

Company, which reengineered its accounts payable processes and achieved a 75% reduction in head count, the Leicester Royal Infirmary neurology clinic, which reduced its Outpatients 'initial visit to care plan' process from 12 weeks to 1 day, and Rank Xerox (UK) Ltd. which, by reengineering its order management process, achieved estimated benefits of around £14m per annum (Hammer 1990, Williams 1993, Talwar 1994).

Even already successful organisations such as the Microsoft Corporation have undergone reengineering projects, to "innovate not only [their] products but also sales, marketing and operations", feeling that they "could not just follow and react to what others were doing". Oakland (1994) explained that "many outstanding organisations, including Hewlett-Packard, have achieved and maintained their leadership through process re-engineering", and the most widely quoted success stories included organisations such as IBM Credit, Kodak, Texas Instruments, British Telecom, and the National & Provincial Building Society.

On the other hand, the literature also contains many examples of "failed" BPR projects. Hammer (1990) and Davenport *et al* (1990) have suggested a figure as high as 75% of early projects failed to deliver what they promised, although one must note a certain lack of clarity concerning what the criteria for a "failed" BPR project should be. For example, if an organisation is aiming for a 50% improvement in a specific process measure, but achieves only 25%, can this necessarily be considered a failure?

Given both successes and failures, it is important to consider which factors seem to be critical to the success of BPR initiatives, and which factors inhibit success. Several factors have been suggested as essential elements of any reengineering initiative, including:

1. Establishing strategic purpose;
2. Ensuring top management direction and support, with strong leadership;
3. Establishing cross-functional involvement;
4. Creating a sense of urgency, in order to maintain momentum in the face of resistance and cynicism, and go for early wins;
5. Setting stretch goals and ambitious targets;

6. Defining core processes;
7. Redesigning and creating higher level processes (i.e. major end-to-end activities in an organization, such as the new product development process already discussed above);
8. Conducting effective change management, and ensure good communication of plans and structure at all times;
9. Establishing systems to ensure staff from different functions can work together (and improve or remove interfaces between the functions, as suggested by Davenport above);
10. Promoting stakeholder involvement with effective planning and project management;
11. Combining top-down and bottom-up initiatives - reengineering should not take the place of TQM.

(After: Hammer 1990; Kaplan & Murdock 1991; Davenport 1993; Stewart 1993; Bartram 1994; Talwar 1994; Hewitt & Yeon 1996).

Similarly the main inhibitor of success has been suggested as a lack of fundamental shift in the attitude of individuals involved (Hammer 1996). Additional research in this area (Parra 1994) has suggested the following as being causes for BPR failures:

1. A long established hierarchical structure
2. Lack of senior management commitment or involvement;
3. Lack of a clear definition of the scope and scale of the work;
4. Lack of training (in particular of IT staff);
5. Overlooked people and change management issues;
6. Lack of process measuring mechanisms;
7. Lack of a strong case for action to justify the project;
8. Too much time spent on analysing existing processes;
9. Lack of team members commitment;
10. Lack of definition of process owners responsibilities;
11. Not using appropriate process flow software tools.

(After: Hammer 1990, 1996; Kaplan & Murdock 1991; Davenport 1993; Stewart 1993; Bartram 1994; Talwar 1994; Hewitt & Yeon 1996).

Hewitt (1994) illustrates the dependence of successful redesigning of the supply chain processes on three dimensions, namely information flows, work patterns and authority structures (Figure 1.3):

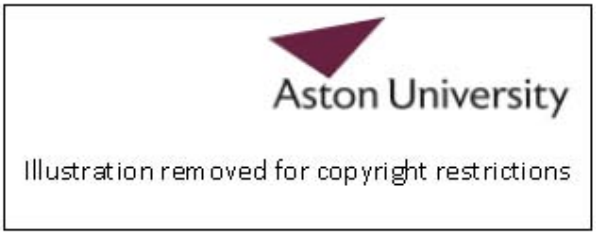

Figure 1.3 Dimensions and Characteristics of Redesigned Supply Chain Processes (F. Hewitt 1994)

In the diagram Hewitt (1994) argues that information is required in a way that can benefit concurrent decision support and work process redesign. This notion further signifies the need for appropriate information systems to support the effective operation of the organisation. Hence, the need for responsive and proactive information specialists. This notion suggests an ongoing partnership between the business and information systems professionals in successful process redesign.

Galliers (1994) similarly has noted the need for an information analyst as an "expert". He argues that, in this context, the analyst takes on "the role of a facilitator: one who guides discussions amongst key stakeholders, provides useful insights, explains analytical techniques, and plays 'devil's advocate' with a view to getting the group to question 'taken-for-granted' beliefs and assumptions". He has also echoed Hewitt's

conclusion that "three aspects of the business had to be changed to ensure improved performance: the procedures, the IT and the organisation itself had to be overhauled, but in an integrated fashion, not separately" (Galliers *et al* 1998).

Whilst recognising the fundamental point that true BPR is multi-dimensional, this thesis relates primarily to the IT axis of Hewitt's model. It attempts to refine our thinking on how crucial the role of IT/IS professionals may be in enabling process orientation.

1.6 EXISTING MODELS OF IT/IS AND BPR RELATIONSHIPS

The initial contributions of IT within business were in administrative data processing and at an operational level to increase productivity and contribute towards improved service. As the capabilities of information technology advanced, its role to support businesses entered a new era where activities such as forecasting were supported by the new information technology. Decision-making at a tactical level began to benefit from automation through the use of electronic access to data in making more informed decisions. In 1985 Porter found that "technological transformation is expanding the limits of what companies can do faster than managers can explore the opportunities" (Porter 1985).

However, although information technology was used in the 1980's as a key tool in gaining competitive advantage, the nature of competition was demanding a more fundamental approach to respond to an increasing changing business environment. Even before the advent of BPR thinking, writers such as Mumford were stressing the need for strategic engagement between IT/IS and business functions, and arguing that computer systems can offer a great degree of value for business effectiveness. However, they usually warned that in order to maximise any benefits the business is required to give careful consideration to business needs and identify problem areas in order to help increase the technology's effectiveness in work practices (Mumford 1986).

With the arrival of BPR initiatives, some writers, including Mumford herself, suggested that the degree of transformation now needed in organisations was so

significant that a new role for systems was required. As technology moved from its traditional supporting role in the back office, it could play a part in allowing organisations to transform their structures and organisations. "The need for major change is so great that existing structures and methods should be removed altogether and new systems based on an analysis of work processes substituted". "These new systems will be enhanced by the inclusion of appropriate information technology which also crosses all the old boundaries" (Mumford et al 1994).

Prominent amongst the "appropriate" emergent IS solutions were groupware and workflow applications, whilst the IT emphasis was rapidly shifting towards client-server computing. Hence propositions such as that of Kirkpatrick, "Groupware is a tool that catalyses organisational change whether you want it or not, as information is power and groupware disperses it far more widely than before. The influence of groupware technology has been recognised as a tool that can transform organisational structures, whether intended or otherwise" (Kirkpatrick 1993). Other authors regarded workflow applications as a natural facilitator of BPR, allowing work to be structured in terms of "objects" which could be routed around the organisation in flexible, non-restrictive pathways (Haywood 1994). Workflow software could automate information flows among all the participants in a company's processes, including internal work groups, strategic partners, customers and suppliers. This would allow new and closer relationships to be formed within and across organisational boundaries.

Similarly, client-server IT systems, i.e. networked solutions enabling distributed processing between centralised servers and low-cost desktop workstations, were also thought to be particularly appropriate in support of BPR projects, a natural medium through which to implement process-orientated organisational models (Butler 1994). Some commentators saw the combination of workflow software and the network technology as a breakthrough in the dissemination of information within and across organisations. Due to the nature of the new IT/IS capabilities, radical integration of information was made possible in support of a process environment (McCarthy and Bluestein 1991).

Electronic dissemination and sharing of information was regarded by some as an intrinsic part of BPR (Haywood 1994). However, it was imperative that processes were well identified and defined before any tools, such as workflow computing could be effectively implemented. Otherwise there would be a risk of automating inefficient processes without first redesigning or reflecting primary business concerns (Frye 1994, McCarthy et al 1994).

Thus, despite these IT/IS advances, most early proponents of BPR still agreed that BPR should not be treated as an IT project, nor should the technology, with all the opportunities that it may offer, be allowed to drive BPR initiatives (Davenport 1993, Hagel et al 1993). The fact that IT has an integral role to play in process-focused organisations should not be overlooked, but it should be seen as an integrative element in the overall business content along with corporate vision, structure and culture (Watts 1993). Due to the capabilities and opportunities that IT offers, there is a great risk that it may be allowed to dictate the direction of BPR initiatives, and it is suggested that this should be avoided.

Venkatraman acknowledged the potential of IT as both a success or failure determinant in BPR, and has suggested the following diagram to indicate that IT can be both an enabler and inhibitor of BPR (Figure 1.4):

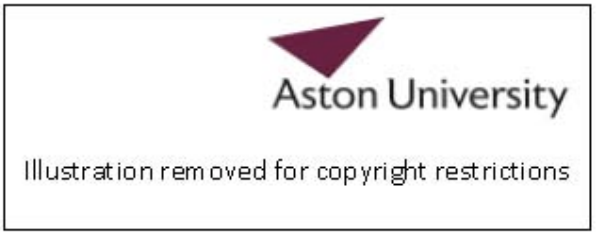

Figure 1.4 Business Process Reengineering: Enablers and Inhibitors (Venkatraman 1991)

The diagram demonstrates the two sides of the argument to help measure the opportunities and risks offered by IT in a BPR project. As an organisation's IT dependencies grow to help provide a quick and efficient customer-focused service then so does the risk grow of being involved in partnership based business created by such developments as electronic commerce. Traditional IT infrastructures can therefore impede a BPR effort, because where data and systems designs have been built to serve internal and functional needs, this may impose limitations on the integration processes. Incompatible data and systems that do not communicate will inhibit effective BPR, as organisations find the costs and risks associated with new systems to be unacceptable and the current systems are unable to function as is required. IT architectures, alongside applications and tools, can enable BPR, "but can also constrain it or displace one disfunctionality with another" (Earl & Khan 1994). Therefore, BPR initiatives need to identify the risks that are imposed by inappropriate applications of IT, otherwise there would be a danger of automating an inappropriate existing task or practice.

According to this line of argument, due to the risks involved in a misuse of the application of IT, the focus of BPR should go beyond the capabilities of IT provision. An approach to strategy formulation and organisation change is required which incorporates both IT/IS and BPR fundaments, without placing IT in the centre stage (Galliers 1994). Moreover, models such as the one illustrated in Figure 1.5 illustrate the perceived interrelationship between the key ingredients of business transformation. The model strives to illustrate the need for integrating the key aspects of process redesign, which is heavily dependent on the overall business strategy, together with the need to align people and technology within the holistic picture:

Figure 1.5 Business Transformation Pyramid
(Preece & Peppard 1994)

When redesigning the organisation these three elements must be aligned to the needs of the market and the customers, and with each other. Technology is therefore recognised as an essential strength of the organisation, but must be considered within the context of the overall business strategy, and based on the requirements of newly designed processes and the people working within them. Information technology solutions should not drive the business strategy, despite enabling new ways of working. This must be developed in terms of the needs of the business, and this relationship is shown in the diagram below (Figure 1.6).

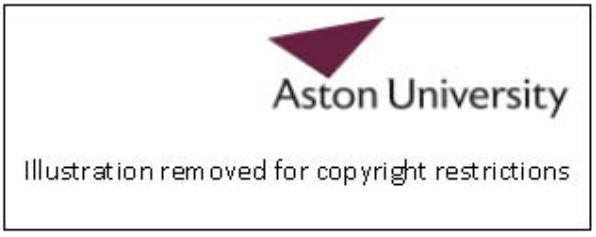

Figure 1.6 The Building Blocks of an Organisation
(Preece & Peppard 1994)

Extending this argument, Peppard et al later caution that "the potential of IT to transform business is not in question; it is how to unlock that potential that is the question and BPR seems to be providing one answer". As a result it can be argued that one of the key reasons for IT failure has been due to the application of technology to old and current work processes as opposed to understanding and improving the work processes then applying the technology appropriately. Technology-enabled transformation depends on a flexible organisational structure replacing any traditionally established work structure (Peppard et al 1995).

Macdonald has suggested that with such business transformations as BPR it is inevitable that both the external and internal perspectives need to be incorporated. However, for this writer, although it is important to recognise the need for alignment of external and internal business strategy factors, the realignment of these various elements needs to have come from a strategic vision. The strategic position of an organisation in its external environment must drive and be supported by appropriate organisational infrastructure and processes (see Figure 1.7). These in turn must be supported by an adequate and suitable information systems infrastructure and development and implementation processes. These will therefore require an appropriate IT strategy, which will be developed with an eye on the IT marketplace, and this will support the organisation's business strategy with the necessary products and services.

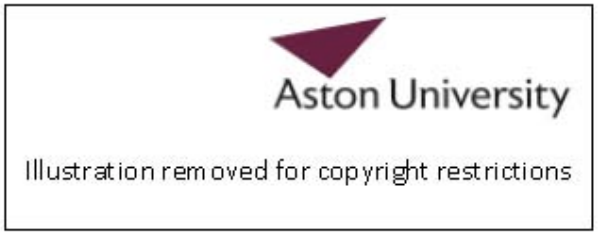

Figure 1.7 The Strategic Alignment Process
(Macdonald 1991)

Other authors have also stressed that IT developments must also be viewed from outside an organisation as a driver of much of the change in the competitive environment. Rockart and Short (1991) have considered that the effect of new information technologies had produced exactly the dynamic, global, "technology-enabled", increasingly competitive environment that the proponents of BPR suggest had forced organisations to consider redesign in the first place. They have suggested a circular relationship, where developments in information technology have driven the competitive business environment, and these in turn have driven the developments in IT, as shown below: (Figure1.8):

Figure 1.8 What is Pushing the Move to Networked Organisations?
(Rockart & Short 1991)

Thus the external environment of organisations has driven competitive forces and these have driven developments in technology.

Similarly Davenport and Short describe a recursive relationship between IT and BPR, whereby an organisation investigates how information technology can support its

business processes at the same time as establishing how business processes can be transformed using technology (Figure 1.9).

Figure 1.9 The Recursive Relationship Between IT Capabilities and Business Process Reengineering (Davenport & Short (1990)

They refer to this as the "New Industrial Engineering", as it goes beyond the work of Frederick Taylor and his "industrial engineering" mentioned above. Business process reengineering and the capabilities of information technology are considered simultaneously, and each is integral to the other. Information technology solutions are not thought of in terms of an organisation's functional departments, but in the ways they can support the new or re-designed processes that span these functions. Indeed, following BPR those functions may cease to be recognisable as organisational entities at all.

Robson has described a similar connection when dealing with the relationship between BPR and IT, outlining what she calls the "Four Forces for Openness", namely new environment, new technology, new "geo-political order" and new enterprises (Robson 1994). For such writers IT, driven by external forces, is a more

active ingredient of a BPR initiative than some other writers would assert. Robson has suggested that continuing changes in the macro environment had created the need for a different kind of organisation, as the "traditional ones simply do not survive the new circumstances". Simpler, flatter, team-oriented organisations are the result, with a "team commitment rather than a command and control mentality". The changes in the other three forces have driven changes in technology, creating a "new role" for IT, and this has in turn driven the changes in the other three forces.

A related view is that organisations develop the technology they require based on other variables within their structure. Benjamin & Levinson investigated IT and organisational change from an internal perspective (Benjamin and Levinson 1993). They used a simplified version of the 'Organisation in Equilibrium' model suggested by the 'Management In The 90's' program (Scott Morton 1991) to include the three elements of organisation and culture, IT and business process. They argued that change moves an organisation from an old state of relative equilibrium to a new one, and if one of the components in the organisation experiences change then there must be changes in the other elements to maintain the organisation's equilibrium. Applying this to business process re-engineering, if an organisation were to undertake a BPR exercise and the modification of it's business processes, this would lead to changes in organisation and culture. The equilibrium of the organisation would need to be maintained by making changes to the information systems underlying the modified processes. Thus when Ford centralised the accounts payable function, reducing staff and improving quality and customer satisfaction, the change required new technology and changes in the organisation and culture to support it, to ensure that the equilibrium of the organisation was regained, and the change was sustained and effective.

Recently Kallio et al have pointed out that IT is a key ingredient of BPR at least to an extent that the size of the organisation becomes less of an issue provided that advanced IT infrastructure is available and appropriate education and training is in place. However, they recognise that new IT on its own cannot add value to the business, and a shift of traditional organisational culture and value is required to help replace an organisational environment and structure which has been inherited from the industrial revolution (Kallio et al 1999). Twiss et al have suggested that successful

transformation in organisational structure is nowadays mainly dependent on the adoption of a digital working environment, allowing such organisational structures to revive and regenerate themselves through application of information technology (Twiss et al 1998).

Thus the debate on the role of IT/IS in BPR is now more than a decade old, but it is still active. From the number and variety of models that have been developed to illustrate the relationship it is clear that no absolute consensus has yet emerged as to whether IT/IS developments are proactively driving reengineering or simply reactively supporting it.

In some models the overriding philosophy has been that an organisation must consider its business needs and define the processes to be redesigned before information technology is even considered. As much as the enabling role of IT is recognised in organisational change and in economic evolution it is emphasised that technology alone can not guarantee BPR implementation (Macredie et al 1999). For other writers IT/IS capabilities assumes a more positive role in BPR initiatives. These writers see the emergence of new IT capabilities as one of the main stimuli to BPR. To this effect Broadbent et al suggest that managers should complete an audit of their IT infrastructure capabilities because they believe these capabilities have an important impact on the speed and nature of BPR. These researchers found that "the availability of appropriate [IT] infrastructure capability was a key factor *preceding* the successful implementation of redesigned business processes" (Broadbent et al 1999). IT/IS can then be used to drive process re-designs based on the requirements and customers of each process.

Hammer and Champy have taken this thinking even further, and recommend "inductive thinking", whereby an IT 'solution' is recognised and then the problems to which it can be applied are then searched for. They feel that the challenge that organisations must meet is "recognising the business possibilities that lie latent in technology". Information technology has the power to break the rules implicit in the way work has always been done, and therefore enable the radical change associated with BPR. Referred to as the "disruptive power" of information technology this is critical to companies looking for competitive advantage, as new technologies are

capable of dispelling previously held beliefs about how an organisation's work must be done (Hammer & Champy 1993).

In yet other models the organisation needs to consider its external environment and internal capabilities and balance the requirements of each. Its IT/IS capability is a key element in this assessment, and will determine the possibilities for BPR, but it is one element amongst many, and is neither more nor less important than other ingredients in the change process.

The debate concerning the interrelationships of IT/IS and BPR continues, and this research is concerned primarily with one sub-aspect of the debate. Its primary focus is upon investigating the appropriate role for the individual IS professional (ISp) in BPR initiatives. But the role of the specific individual is usually set within an organisational context of an IT/IS department. It is relevant, therefore, to also review the literature on the more general topic of the evolving role of the IT/IS department in which these specialists may be organisationally located.

1.7 THE EVOLVING ROLE OF THE IT/IS DEPARMENT AND OF INFORMATION SPECIALISTS

When initially proposing process oriented thinking, Davenport and Short considered what the information systems function should do to prepare itself for a role in process redesign activities. They suggested that the answer would be that the IT professionals would have to recognise that they would have to build most systems needed to support or enable processes, rather than purchasing them from software package vendors who had often provided the existing, functionally oriented, legacy systems (Davenport and Short 1990). Therefore, they called for IT professionals to be more flexible and knowledgeable in the provision of process oriented technologies and software. But the focus on operational task automation and integration to help enable process redesign meant that the role of information professionals was still expected to be largely limited to technological support rather than greater business involvement (Davenport 1990).

However, as cross-functional BPR projects began to proliferate, new responsibilities emerged which placed increasing demands on the IT function. The ISps, whilst still not regarded as the drivers of the change initiative, began to become more general advisors and participants in BPR programmes (Douglas 1993). Systems prototyping and testing across organisational boundaries required increased communications and organisational skills as well as technical knowledge. The IT/IS department's challenge became to demonstrate that it could participate fully in the "experimental and iterative activity of defining new processes" (Talwar 1993).

One consequence of this enhanced role was a greater need for "technical" IT professionals to work closely with IS "systems" professionals within the same department for greater understanding of the potential of both technology and applications software in support of a process oriented organisation. But the greatest impact of BPR thinking on the IT/IS function was generally recognised as the encouragement of the IT/IS function to become more business oriented (Bluestein and Hill 1993). Aligning IT capabilities with the business requirements has become one of the key roles and mantras of the IT/IS department in the second half of the 1990s. The IT/IS department is expected to ensure that it understands the business as a whole and anticipates what its IT requirements are (Sykes 1995).

This understanding of what the business requires from IT should lead to more effective utilisation of technology in ever changing organisations (Earl & Skyrme 1992). In such an environment the IT/IS department will be required to continually supply new deliverables, including wider information provision through adoption of appropriate software and hardware and systems maintenance and upgrades. In particular the IT/IS department is usually expected to resolve the issues of how the problems of legacy systems will be overcome. These can restrict BPR projects because of a lack of connectivity between functionally designed systems and their data models but, as they usually represent years of development, the legacy systems often cannot be as easily replaced as Hammer's "Don't Automate, Obliterate" rhetoric might suggest (Earl & Khan 1994).

Others have observed that as organisations are constrained by resources and BPR initiatives are often cross-functional, the management of the IT/IS department usually

has assumed the responsibility during BPR initiatives of evaluating all technology very carefully from a financial perspective before implementing any changes. Investment appraisal must include an investigation of the benefits of the technology, a calculation of costs and the payback period, risk assessment and an investigation of all the alternative options (Olson 1993). Although this focus on cost benefit analysis is not new, some observers have suggested that it has been given more prominence with the advent of major BPR projects and that the IT/IS function has assumed a greater role in the calculation. It has been acknowledged that IT itself has no direct value to an organisation, but the costs and benefits are company wide and therefore the addition of value to the business as a whole must become the focus of the IT function (Brett 1995). Moreover, investment management processes have had to be in agreement with capital budgeting to help justify and formalise corporate wide IT expenditure and secure management commitment (Bensaou et al 1998). The IT Group of Texas Instruments Inc. felt that because of the new challenges of BPR their most important tasks would be to keep costs under control whilst at the same time producing client-server applications quickly (Moad 1993 & 1994).

Concerns over a lack of effective approach to measure and demonstrate the value of information technology in ways similar to those used by business management to make other investment decisions continue (Parker et al 1998). This is exacerbated by the fact that assessing and measuring the exact value of IT has become an increasingly difficult task due to the fact that separating out the IT input would suggest disentangling a potential integrated process (Willcocks et al 1997). The value-adding role of IT, when applied appropriately, has, however, been generally recognised: "IT can be instrumental in making capabilities become core (i.e. making them rare, valuable, difficult to imitate, and with no strategically equivalent substitutes)" (Andreu and Ciborra 1998). Technology has been seen as imperative to help providing competitive business advantage. Moreover, it has been suggested that appropriate investment planning of IT by business managers is essential in ensuring strategic business success (O'Brian 1999). The overall conclusion of the majority of students of the subject is that cost justification of BPR projects is necessary and possible, and that the IT/IS department has a significant, perhaps leading role to play in formulating the analysis.

At the same time by investing in business change projects, rather than pure IT projects, the IT function has been able to move the focus away from its own needs and the actual technology towards the requirements of the business itself. Thus in an effort to justify their own business value and that of the change initiatives in which they are involved, a number of writers have suggested that IT functions have had to become more focused on the needs of their key customers within the business functions (Brett 1995).

Some researchers have suggested that once a reengineering effort has begun, not only the roles and activities of the IT function will need to change in tune with the new requirements of the business, but also their organisational alignment may need to be changed. ISps on the Texas Instruments project suggested that the IT department would be unable to play a full facilitating role unless their activities were re-organised to support the reengineered processes and the new ways of working, by, for example, shifting roles from developing systems for a single, narrow functional department such as purchasing or shipping, to delivering systems to help support redesigned processes spanning several departments (Moad 1993). Indeed, this realignment may be essential to ensure that the redesigned organisation, regardless of the magnitude of the BPR effort, continues to experience the benefits it has accrued. Whereas, prior to BPR, specific departments owned the systems that worked as a stand-alone function, a new process oriented approach may require that systems will be owned by the process owners as an inherent part of the process. Alternatively it has been suggested that process teams should take collective ownership for the systems that enable their processes (Zahran 1994). The ISps may be required to work as an intimate part of the process helping to shape the vision, objectives and goals, bringing into question the very need for an IT/IS "Department" as such.

Even if IT/IS is retained as an organisational entity a number of authors have pointed to the need for a culture shift within the entity (Moad 1993). To this extent Ward et al comment that a traditional IT/IS function has been a sub-culture of the organisation and one that has been difficult to unify with the rest of the organisation, thereby creating a gap between IT and the business which is the antithesis of what is required in a process oriented organisation (Ward et al 1996).

This gap has been demonstrated more recently in the ProSci Benchmark Report (1999), which highlights the contrasting perspectives of IT function's role in business process re-engineering initiatives. Their research highlights the different views of the various participants. For example, IT professionals in the survey regarded their role as a driver of work practices who would not be intimidated by change. In contrast, most users viewed IT as housing the technology specialists who possess more knowledge of the technology than the users. Therefore, from the users' perspective, IT professionals would have a technology focus. In this context other reports suggest that IT specialists are still, in practice, primarily technology-driven with little regard for users (Bensaou et al 1998).

Edwards et al (1995) also state that a change to IT/IS management attitudes is needed if IT/IS is to truly integrate with the business. They suggest that the following influences could be a result of a lack of coherent IS strategy, properly integrated into the business strategy:

1. Competitors, suppliers and customers may gain advantages over the organisation.
2. Business Goals will become unachievable due to systems limitations.
3. Systems are not integral thus causing duplication of effort, inaccuracy, delays and poor management information.
4. Systems' implementations are late, over cost and fail to deliver expected benefits due to lack of clear focus on key business needs.
5. Priorities and plan are being changed continually producing conflict among users and IS staff, and poor productivity.
6. Technologies chosen do not integrate and even become a constraint to the business.
7. No means exist to establish appropriate IS/IT resource levels, to evaluate investments and to set priorities consistently.

From the preceding sections it can be seen that information technology and information technology solutions have a powerful part to play in business process reengineering projects, whether as driver or enabler of new process design. However, BPR initiatives bring important implications for the IT/IS Department, as it will be the role of this function to deliver on the new information requirements of reengineered organisations. The IT/IS function has been cautioned that in order for it to contribute

to BPR it needs to be prepared to confront and deal with a number of challenges (Talwar 1993). The changing role of the IT function has been examined by a number of authors in the light of the new challenges, and the need for business aware / technology literate Information Specialists capable of taking a lead on justifying BPR has been postulated. On the other hand recent surveys such as the 1999 ProSci Benchmark report a continuation of traditional technology focussed activity by ISps, at least in the eyes of the users. What is therefore required, and what the research in this thesis provides, is a number of detailed empirical investigations into the actual experiences of companies which have recently undertaken BPR initiatives.

1.8 RESEARCH SCOPE, INVESTIGATING CONJECTURE AND PROPOSITION

Many authors (Mumford & Beekman 1994, Davenport & Short 1990, Earl & Khan 1994, Hewitt 1995) have argued that the conceptual underpinnings of BPR are not new, and that organisations have always been reviewing the way they conduct their business by reviewing their processes. Turner (1998) argues that both business process redesign and reengineering address the need for a change in current work practices in favour of substantial performance improvement. This research adopts Turner's view on redesign and reengineering. The organisations involved in the research have been through different types of change initiative programmes within their organisations. However, what is important is that the organisations have all been through a transformation initiative which in all cases involved reassessing their existing work practices and information requirements in order to fundamentally change the work processes.

Thus all the organisations in the survey conducted for this research have been transforming their business activities in order to become more responsive to the market place and customer demand. As Revenaugh has stated: "whether business process reengineering is called process innovation, business process redesign, business engineering, or process engineering, companies are making dynamic and radical changes to the way they operate" (Revenaugh 1994).

The specific aim of this research is to investigate, document and analyse the role Information Specialists (ISps) played in these initiatives and to test the postulation that the role of the ISp in reengineering initiatives and thereafter in the resultant process oriented organisations is different from that of the traditional IT/IS technical specialist. In particular evidence is sought for the proposition that in process oriented organisations ISps come to play a wider, more business oriented and more proactive role than they did within their previously traditional, functionally oriented organisations.

Chapter Two

Research Methodology

2.1 CHAPTER SUMMARY

The previous chapter dealt with the focus of this research based on the literature available at the time it was undertaken. The literature review helped shape the research question and the associated hypothesis and proposition. The resultant hypothesis is that it is likely that during BPR initiatives, and ongoing thereafter within process oriented organisations, ISps assume a different role from that of the traditional IT/IS specialists working in functionally oriented organisations. Specifically, it is postulated that in process oriented situations ISps play a wider and more business oriented role than traditional ISps.

This chapter discusses the methodological approach used to test this proposition. The aim is to illustrate the choices available to the researcher and to justify the rationale for the particular approach that has been selected in relation to the nature of the question under investigation.

Before deciding upon a specific design the researcher must decide on more general issues, particularly the research paradigm within which the investigation is to be conducted. Firstly, therefore, the relative merits of a positivistic and a phenomenological approach are discussed, both of which have proponents within the business studies research community. The position adopted here is that, given the nature of the research hypothesis, a combination of the two paradigms is both possible and appropriate.

The goal of this research is to compare the role of ISps before, during and as a result of Business Process Reengineering. It follows that an empirical approach, i.e. the collection and analysis of data related to actual experiences is likely to yield most insight. Furthermore, a research design which combines a quantitative approach based on a questionnaire with more qualitative data gathering through semi-structured interviews and in depth case studies is seen as combining the strengths of both approaches. It is suggested that a progression from the general insight provided by a simple questionnaire response from a wide range of participants, through increased insight provided by follow-up interviews with a sub-set of respondents, followed in turn by four in depth case studies is an appropriate research structure.

Finally, the resultant research design is explained in detail and a retrospective comment is made on lessons learned during the conduct of the research.

2.2 PARADIGMS, POSITIVISM AND PHENOMENOLOGY

The term paradigm has been defined as "a process of scientific practice based on people's philosophies and assumptions about the world and the nature of knowledge" (Hussey *et al* 1997). A number of research paradigms have been developed as frameworks to help researchers design appropriate data collection and analysis methodologies. Gummesson notes that the research paradigm that is adopted will greatly influence the choice of the methodological approaches to be deployed (Gummesson 2000).

In research into business the main discussion concerning research paradigms has centred around the relative merits of positivism and phenomenology. The essence of the debate centres on the researcher's understanding of "truth" and "reality". All researchers wish to believe that they are in search of uncovering "truth" or "reality" within their research matter. But they may differ in their understanding of the nature of truth and reality.

Positivism believes in and seeks to establish absolute truth, whereas phenomenology denies the existence of absolute truth, and sees truth as context dependent. A positivistic approach *"seeks the facts or causes of social phenomena, with little regard to the subjective state of the individual"* (Hussey *et al* 1997), whereas "phenomenology is the study of experiences and the ways in which we put them together to develop a worldview" (Marshall and Rossman 1995). Marshall *et al* define phenomenology as "the study of lived experiences *and the ways we understand those experiences* to develop a worldview" (Marshall et al 1999).

This research does not restrict itself to operating solely within either of these paradigms, rather it accepts the relevance of both positivistic and phenomenological approaches at different points in the investigation.

The first stage of primary research commenced with a questionnaire survey. The aim of the questionnaire was to determine the level of involvement of the participating organisations in BPR initiatives. The questionnaire was restricted to ten closed-ended questions in order to increase the response rate. The use of a short and specific set of questions reflects a positivistic approach at this stage of the enquiry. Gummesson (1991) characterises the positivistic paradigm as being well suited to "well-defined, narrow studies". A positivistic paradigm is stated to help "maintain a clear distinction between facts and value judgements; search for objectivity" Gummesson (1991). This form of data collection is perceived to be one in which the role of the researcher is less participative and therefore there is less scope for his/her value judgement to influence the findings. Remenyi et al (1998) considers that by using a structured questionnaire the researcher can be "independent of and neither affects nor is affected by the subject of the research".

The closed-ended questionnaire approach also lends itself to the use of simple statistical means and distributions to interpret the data, thus enabling the researcher to "discover an object of research external to [herself] rather than "creating" the actual object of study" Gummesson (1991). In this research the questionnaire findings provided the basis for understanding the status of BPR projects across a variety of organisations, thus providing a platform from which to structure interviews and case study investigations aimed at probing the more subjective, experiential aspects of the research.

Although the survey questionnaire in this research offered valuable background data and a starting point for more detailed fact finding, it was decided in formulating the research design that a purely positivistic approach would not be appropriate for the later stages of the research. The option of further and more sophisticated multi-variate data analysis was rejected in favour of a more subjective phenomenologically based approach. The prime concern has been to investigate the *experiences* of the ISp in the process redesign initiatives of participating organisations. It was recognised that a purely positivist approach might limit the investigation on the basis that positivists "tend to turn the social world into an obscure matrix of calculation, far removed from concrete reality of direct experience" (Bien 1978).

Stages 2 and 3 of the research therefore adopted an interview/case study approach which is phenomenologically based. As described by Marshall et al (1995, p.82), this approach is particularly suitable for " the study of *experiences* and the ways in which we put them together to develop a worldwide view of reality". Studying the role of ISps involved obtaining information from individuals based on their *perception* of facts and their *opinion* of the situation. A phenomenological paradigm was therefore adopted, since "phenomenology seeks to understand the lived experience of individuals and their intentions within their "lifeworld"" (Crabtree *et al* 1992 (edited)). On the other hand a totally freeform interviewing approach was not seen as appropriate. Crabtree *et al* 1992 (edited) caution that "investigators must "bracket" their own preconceptions and enter into the individual's lifeworld and use the self as an experiencing interpreter". It was therefore imperative for the author to endeavour to create an environment where the interviewee's experiences and comments were recorded with minimum influence from the author. During each interview a list of question areas was presented to the participants as a guide to the interview. This assisted the discussions to some extent as in some cases the interviewee would discuss an area in more depth than others depending on his/her experience.

In summary, the aim of this research is to determine the 'truth' about the way in which the role of ISp has evolved as a change agent in process oriented organisations. To do this a combination of techniques and approaches has been used. A questionnaire was used as an initial tool to gather some preliminary data about the extent to which the organisations were involved in process redesign and the degree and level of involvement of ISp in the process redesign initiative. In addition, the questionnaire was used as a tool to introduce the research to the potential participants as it was recognised that the target audience would have limited time to offer to take part in the data collection process. Then, follow-up interviews and case study interviews were held with a sub-set of respondents to examine qualitatively the findings derived from the questionnaire and to probe more deeply into the experiences of the ISps. It is the author's belief that combining these different approaches and rejecting a single paradigm has proved an effective way of testing the research hypothesis as outlined in Chapter One.

2.3 DETAILED RESEARCH DESIGN

The following diagram (Fig. 2.1) depicts the stages involved in this research.

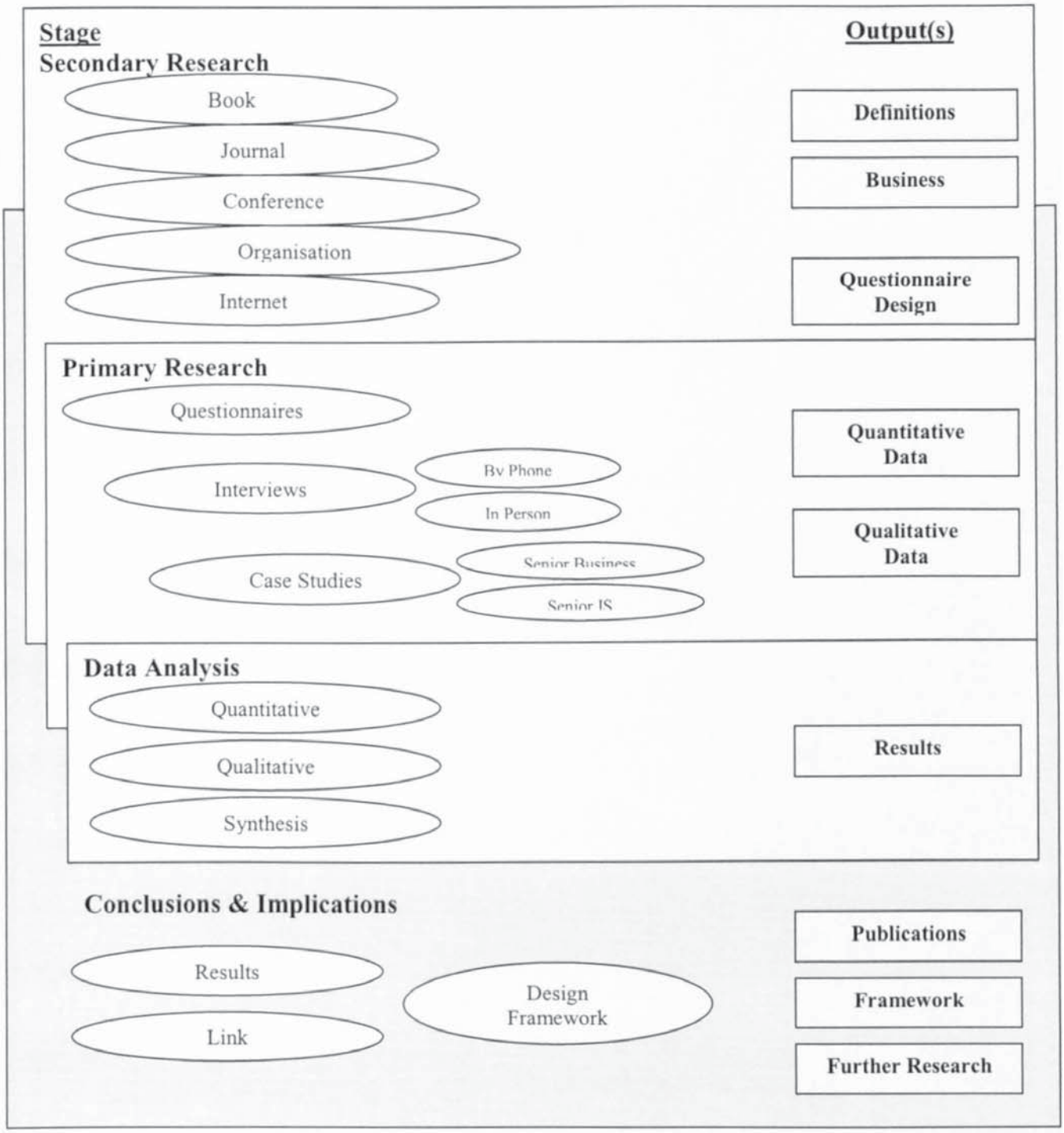

Figure 2.1 Stages Used in This Research

A thorough review of secondary sources helped to finalise the research question and set the groundwork for primary data collection and analysis. It should be noted that searches of secondary sources continued throughout the research, and therefore this element of the work overlapped with the field work and continued until the final drafting of the report.

The primary data collection and analysis took the form of three largely sequential stages, namely:

- Questionnaire based survey
- Follow-up interviews with a sub-set of questionnaire respondents
- Case studies of four of the interviewees' companies.

The final stage of data analysis incorporated and synthesised elements of all stages of data collection in order to represent the overall findings of the research.

Details of each of the stages follows.

2.3.1. Secondary Sources

The main sources used in secondary data collection included books, journals, conference proceedings, the Internet and some internal documentation and white papers supplied by companies participating in the later stages of the research.

Books

When the research first commenced there was limited literature in the form of books, due to the novelty of the topic of BPR. Scott Morton's edited 1991 book, "The Corporation of the 1990's - Information Technology and Organisational Transformation" (Oxford University Press) was the earliest publication to prompt the researcher's interest in the relationship between organisational transformation and the application of information technology (Scott Morton (ed.) 1991). Hammer and Champy's book "Reengineering the Corporation – A Manifesto for Business Revolution" (Hammer & Champy 1993) pointed the researcher to an emerging and, at that time, radical school of thought discussing business transformation using IT as an enabler to achieve dramatic levels of change. The work of Davenport (1993) further

developed the author's thinking about the changing role of technology and the complex role of IT in process redesign.

In addition, the work of leading authorities in the UK such as Ward and Griffiths (1990), Peppard and Rowland (1995) and Galliers and Bates (1997) played an important role in this research. Galliers and Bates (1997) edited a book that included the work of Andreu and Ciborra (Galliers and Bates, eds., 1997) who argue that IT needs to be embedded "into core capabilities of the organisation". The book also included the work of Pettigrew, who discusses the strengths and weaknesses organisational change techniques. The work of Ward and Griffiths (1996) focused on the strategic aspects of IS/IT with respect to corporate strategy.

Overall, therefore, the research took place throughout a period when a number of leading academics on both sides of the Atlantic were publishing significant books on the subject matter (see References at the end of this thesis for a comprehensive listing). However, due to the very fact that the business environment and technology were in constant flux, these books, whilst important, suffered from the inevitable time lag involved in their publication, and it was clearly necessary to also search more current secondary sources.

Journals

Hammer's Harvard Business Review article (1990) initiated the discussions around the concept of BPR and advised organisations to "[break] away from the old rules about how we organise and conduct business", and suggested "looking at the fundamental processes of the business from a cross-functional perspectives". The fundamental elements of BPR were further discussed with particular focus to the enabling role of technology and process innovation by Davenport and others in a series of articles published in the first half of the 1990s (Davenport & Short 1990, Davenport 1993, 1996, Davenport and Beers 1995). These articles played a major role in formulating the current research hypothesis.

The work of Earl and Khan (1994) was also highly influential, particularly in stressing that IT can make a difference to a BPR initiative depending on how effectively it is adopted, noting that IT architectures, alongside applications and tools, can enable

BPR, "but can also constrain it or displace one disfunctionality with another" (Earl & Khan 1994). The work of Hewitt (1994 and 1995) was significant in that the dependencies of BPR in a specific operational area, supply chain management, were examined and discussed in depth and helped to illustrate the interdependencies of key variables in the context of a specific business process.

Throughout the research a great deal of attention was paid to journal articles discussing various case studies and arguments on the novelty or otherwise of BPR. Views and definitions varied immensely, hence it was decided that this research had to be clear on the definition of any terminology used, as discussed in Chapter 1 above. The key academic journals investigated at the time of the initial stages included, but were not confined to: the Harvard Business Review, Journal of Information Management, Journal of Information Systems, and the Sloan Management Review. For the purposes of this research careful study of the academic journals was accompanied by a review of weekly practitioner computer journals and newspapers such as Computer Weekly. These weekly periodicals and journal tend to discuss BPR and ISp in less abstract ways, and deal directly with issues such as practitioner skills requirements.

The advantages of using journal articles in addition to books centre on the fact that the turnaround in publication is relatively short. Due to the nature of change in the business environment and developing technology, journal articles had more chance of reflecting the recent past and predicting the near future compared to books. Nevertheless, journal articles present the opportunity for a focused discussion and, in the case of academic journals, articles often referred the researcher to other material. A list of articles which proved useful in the development of this research and its conclusions is to be found in the References section at the end of this thesis.

Conference proceedings

The novelty of the subject area of BPR and the impact/implication of emerging technology in achieving successful business transformation resulted in conference organisers taking advantage of the opportunity to hold forums on these subjects throughout the 1990s. Successful practitioners were invited as keynote speakers to share their experiences with academics through presentations and discussion

platforms. Attendance at these forums proved invaluable to the researcher, both in relation to directly gathering data and in relation to establish contacts and relationships which formed the basis of the subsequent primary research phases.

Particularly useful conference and seminar events were organised by *Business Intelligence (BI)*, a UK-based conference, research and publishing company. Leading practitioners and academics were among the presenters at these events. Another prominent events organiser was Cranfield University, one of the UK's leading institutions to bring BPR to prominence in the academic arena. Cranfield organised one of the first European BPR events. This conference explored the topic mainly from an academic and theoretical viewpoint with some practitioner contribution (Cranfield BPR Conference 1994).

During the research several conferences were attended and data were collated from the proceedings together with additional notes from the presenters' oral presentations. In some instances the researcher used the opportunity of conference attendance to ask, on individual basis, specific questions related to the scope of the research.

In the later stages of the work the researcher was also able to use mainly academic conferences as a vehicle for the presentation of initial findings, which has proved invaluable in formulating the final conclusions presented in this thesis.

Electronic discussion groups

As the literature review progressed the Internet became a significant research resource, both as a source of data and as a vehicle for refining the findings. In the later stages Internet based discussion groups have played a role in disseminating the findings. In particular "BPR-List", has proved extremely effective as a forum to discuss various aspects of BPR and has become a helpful vehicle for researchers and practitioners to share ideas and experiences.

Company specific documents

In certain cases companies contacted initially via conferences were approached to discuss their approach to BPR with particular reference to IS and ISps. A number of these companies made their internal documentation on the subject of BPR available

for the purposes of this research. For instance as early as 1993, McKinsey & Company provided a booklet containing a collection of unpublished articles discussing "The Case for Core Process Redesign". In many ways the thinking in these publications was even more current than that appearing in any published form, and as such was invaluable in tracing the latest practitioner thinking. In the later stages of the research unpublished internal company documentation from the case study participants also played a similarly key role in adding understanding to the interview and case study data.

The following table (Table 2.1) summarises the strengths and weaknesses of the various secondary sources used in this research. It is the researcher's contention that in combination they provided a solid base from which to define the research question and design the primary research approach.

Secondary Research	Strengths	Limitations
• ***Books***	• More detailed • Well researched • More established • Clear discussion of the evolutionary process	• Due to the nature of the topic (business and technology) out of date by the time printed • Industry and technology in constant flux
• ***Journals*** • **Academic journals**	• More academic credibility • Focused • Relatively current • Up-to-date	• Discussions can be based on theory with little evidence to support
• **Weekly periodicals and Practitioner Journals**	• Case study oriented	• Too brief • Superficial • Context dependent
• **Conference proceedings**	• Practitioners experiences • Various approaches	• Commercial bias • Not always the full story – fear of giving too much away to the competition • Not admitting to failure • If telling about it, then already moved on to something else?
• **Company specific white papers/internal documentation on PR**	• Gain insight into live example • Methods and steps used • Discuss lessons learnt	• Company specific • Context specific • Not tested independently
• **The Internet**	• Up-to-date • Accessibility • Choice	• Depth • Validity? • Bias/independence • Who wrote it?

Table 2.1 Advantages and Limitations of each Secondary Source

2.3.2 Primary Data Collection

Three stages of primary data collection were used in this research namely a postal questionnaire survey of 60 organisations in the UK, followed by "follow-up interviews" either through the telephone or in person with representatives of 20 of the participating organisations, and finally in-depth investigation of 4 case study organisations in the form of face-to-face interviews.

2.3.2.1. The questionnaire survey

Objectives and scope

The primary aims and objectives of the questionnaire survey were:

- To validate the organisation's claim to have been involved in a BPR initiative
- To obtain a general understanding of the role and involvement of IT/IS in the BPR exercise
- To introduce the respondents to the research and establish their interest in participation in further stages of the work

It was therefore decided that the first task was to establish a set of potential participant organisations, chosen from organisations that claimed to have been involved in BPR.

In the absence of any known database of BPR active participants, *Business Intelligence* (*BI*) contacts were used to devise a list of potential organisations to be included in the survey. *BI* was the first company to run an independent UK event on Business Process Reengineering (as it was then called) in 1993, the conference attracting delegates from many of The Times Top 100 companies and some public sector organisations. The list of delegates included the names and initials of individuals together with the name of the organisation they were representing.

A meeting was arranged with the Managing Director of *BI* to explain the research aims and objectives and the confidentiality of any information given by *BI* was confirmed. Once the approval was received, a number of lists taken from various BPR, and some IS related events, were examined. At this stage the list was compared

with one composed of organisations whose PR initiatives had been identified in the form of case studies and examples in the literature.

Effort was made to ensure the final target list would include companies representing a wide variety of industry sectors.

Questionnaire design and content

Hussey et al have noted that "a survey is a positivistic methodology whereby a sample of subjects is drawn from a population and studied to make inferences about the population" (Hussey et al 1997). Furthermore they note that a Descriptive Survey is "concerned with identifying and counting the frequency of a specific population" and can be best analysed via a simple frequency analysis. In contrast, an Analytic Survey is used to "determine whether there is any relationship between different variables... [and to] identify the independent, dependent and extraneous variables". As a first stage of investigation, it was decided that in this research a short, simple Descriptive Survey was both adequate and appropriate.

When designing the questionnaire it was recognised that the target group were senior individuals who would be able to commit to further involvement but would very likely be limited in the amount of time that they are able to spare in completing the questionnaire.

Recognising this the following design criteria were developed:

- Short
- Clear
- To the point
- Helps build trust for further participation
- Gain as much information as possible
- Stepping stone for further in-depth research

Several design approaches were used to meet the overall aims of the questionnaire. As the researcher's previous survey experience had shown that confidentiality is key in such data collection exercises the covering letter that accompanied the questionnaire

reassured the potential respondents with a confidentiality confirmation followed by offering to sign a confidentiality agreement if required. Further, a confidentiality statement was included in the questionnaire and a bold heading was used to clearly define the area and purpose of the research.

Fowler (1993) states that one of the fundamental reasons that may result in respondents to provide less than accurate response may be due to the lack of understanding of the question. In order to minimise this risk, the author listed a set of definitions for the key terms used in the questionnaire in the introduction to the questionnaire, consistent with the definitions outlined in Chapter 1 above.

The selection of the type(s) of question asked was also given very careful consideration at the design stage. There are two main types of questions used in the questionnaire, open and closed, both of which have been used selectively in the questionnaire.

Mangione (1995) notes that "open questions are ones that are asked with no specific categories of response given; instead the respondents answer in their own words." He categorises open-ended questions into two further types: short or long. Short open-ended questions are designed to have specific types of answers. An example of this in this research is where the multiple-choice questions have been designed to include an 'others' option to enable the respondent to include any responses or choices that may have not been included in the list. However, compared with a long open-ended approach, the short open-ended approach may limit the respondent to expand on the answer and hence there is less opportunity to illustrate through examples or discussions on the specific question.

Mangione (1995) further notes that longer open-ended questions are more of a 'narrative' type and are appropriate when respondents are to be encouraged to explain their response in more depth. This approach may take more time to complete the questionnaire, however it provides the respondent with the opportunity to express more than facts and add a degree of personal inference. In view of the intention of the researcher to conduct interviews as a second stage in the research, and in order to

minimise the time needed to complete the questionnaire, longer open-ended questions were excluded from the questionnaire design.

The questionnaire used in this research has, in the main, used a closed-ended approach, supplemented by an 'others' category in some multiple choice questions. Closed questions not only give the question but also present response alternatives; the respondent is encouraged to pick the answer(s) that best represent(s) his or her situation (Mangione 1995). Following approaches are recognised as alternative forms of closed-ended questions:

'Yes-No' questions: This research adopted this style of question design not only to gather information directly, but also as a leading question to elicit further response. For example, the final question in the questionnaire examines the link between IS strategy and business strategy. The second part of the question investigates the time period at which the strategy is updated.

Do you have an IS strategy and planning process linked to the business strategy?
Y/N
If 'Yes'
how often is this strategy updated?

a) Quarterly [ ]
b) Six monthly [ ]
c) Annually [ ]
d) In line with corporate strategy [ ]
e) Other [ ] _____

Multiple choice questions: In this research, in most questions, respondents have been provided with a selection of choices where more than one choice may have been selected. An instruction was provided after each question to help guide the respondent in completing the question. For example, in one question respondents were asked to indicate the dimensions of performance in which improvements are sought. Prior to introducing the selection the respondent is provided with the indication that 'multiple entries are acceptable'. Although these multiple choice questions are in themselves essentially closed-ended, in the questionnaire designed for the purposes of this

research an 'others' option was provided to increase the chance of obtaining further data. For example, in one question the respondents were given a selection of potential parties who may have been involved in the setting up of the initiative. The final choice on this selection list is 'others' to allow for any other parties who may have been involved and not included on the list.

Questions which required a multiple choice answer were used in the following areas:
Scope of redesign: the aim was to determine the scope of organisational involvement in PR. The options presented were: specific process or organisation-wide.

Purpose of redesign: a selection of potential dimensions of performance are you seeking improvements in for redesign were presented to the respondents, namely: Work processes; Information flows; Decision / authority structure and Organisation structure. Respondents were also given an opportunity to give any other reasons using an 'others' option.

Functions involved in the initiative: another area to determine the scale of the initiative; the options were: One or two; Most or all

Project initiators: the questionnaire set out to determine the degree of IS professional involvement in the PR exercise. Since a key aspect of the survey has been to identify the role of IS and make a distinction between the operational and the strategic level, it was important to determine the degree of IS involvement. Respondents were presented with the following options where multiple entries are acceptable: Senior management; Departmental managers; IS strategists; IT management; IT steering committees; Internal customers; and an option to express any other initiators.

Project owners: the literature review indicated a number of debates suggesting IT's role as an initiator and/or driver of the PR initiatives. This aspect of the survey aimed to verify the degree of ownership, if any, in the PR project. In order to ensure consistency the options used for programme owners were identical to that of the initiators: Senior management; Departmental managers; IS strategists; IT management; IT steering committees; Internal customers; Others.

Stage which IS team was brought in: choices presented were: Start of the initiative; When solutions defined; Other

Formal evaluation: evaluation of any information requirements in terms of certain business dimensions: Process; Functions; Organisation wide; Internal customers and Other.

Technology solutions: either currently being used or planned to be used. The options proposed were: None yet identified; Groupware applications; Document management systems; Workflow applications; Client-server architecture; Distributed databases; LANs; Other

IS strategy and planning process linked to the business strategy: a Y/N option was provided to reply to this section. If the reply had been 'Yes', the respondent was asked about the party/parties responsible for carrying out this task. It was requested for respondents to indicate the primary (P) and secondary (S) participants. The options presented were: Senior management; Departmental management; IS strategists; IT management; IT steering committees; Internal customers; Others. This was followed by a further question to determine the frequency at which this strategy is updated: Quarterly; Six monthly; Annually; In line with corporate strategy and Other.

Ranking/Rating questions: These form a third category of closed questions used in the survey. Mangione (1995) defines ranking questions as the "type of question you want the respondent to rank preferences among a group of alternatives". This research has used a type of ranking question referred to as 'ranking scales' which involves "a list of alternatives that range from not much of a particular attribute to a great deal of that same attribute" (Mangione 1995). One question in the questionnaire has used this approach. This question was designed to determine the extent to which the BPR change initiative was expected to affect the performance of the business. The respondents were given instructions as to how the scale was measured. A scale of one to six was introduced with the instruction: "Where '1' describes basic tidy up of the current processes and '6' describes major redesign for radical performance improvement.

Please circle appropriate figure". The scale was introduced as follows:

1 2 3 4 5 6

Robson (1993) refers to this approach of scaling as a summated scale.

As a final question, respondents were then asked about their willingness to participate in a follow-up interview.

The overall design of the questionnaire, with its largely closed-question approach meant that it could be completed by respondents in approximately 15 to 20 minutes, including time to read and digest the definitions and completion instructions. In the opinion of the researcher the design proved effective.

Questionnaire distribution and returns process

A database of the potential companies to be targeted for the survey was compiled, using conference attendee lists and literature search as described above. It contained company name, contact name, job title of the contact, address and telephone number. It should be noted that the questionnaire was devised at a time when the author had the opportunity to meet many of the potential respondents at conferences. Thus the author had approached some of the individuals in the target set during conference events and many gave verbal agreement to participate. Therefore, it was deemed important that general distribution of the questionnaire should follow soon after some potential participants had expressed an initial interest, rather than, for example, after a restricted field test.

One of the primary aims of the questionnaire was to establish initial contact with each company at the right level. In order to achieve this the questionnaire was accompanied with a covering letter introducing the research and the researcher's background, the aims and objectives of the survey, the benefits to be gained by the respondent and researcher, what was expected from the respondent and a statement of confidentiality in order to reassure the respondent confidence. The author offered to sign a confidentiality agreement if required, but none of the respondents decided to take this further. Nevertheless, the author believes that this was an important indicator of

professionalism and a factor in encouraging potential respondents to complete the questionnaire. The author thus endorses Oppenheim's (1992) statement that "all survey data must be treated as confidential, in the sense that only the researcher will have access to them, and steps must be taken to ensure that no information will be published about identifiable persons or organisations without their permission". The message of confidentiality was repeated in the further in the stages of data gathering i.e. the follow-up and case study interviews.

Given the nature of the survey and its senior level target audience, it was estimated that a 20% to 30% response rate would be achieved. With this in mind 100 questionnaires were initially sent out. However, due to the omission of some of the respondents' identification details on the questionnaire, which might have restricted the analysis of results, a further 31 questionnaires were sent to another set of potential respondents using the same source, *BI*, to obtain the contact list. In both cases an effort was made to maximise the response rate through the inclusion of a pre-paid reply envelope.

In the event, all of the returned responses from the first batch were identified, either from an accompanying compliment slip or business card, or the postage mark that identified the geographical location. The second batch included a name, position and address label taken from the companies' address database, and all responses proved useable.

In all, from the total of 131 questionnaires which were sent out, 60 useable responses were received. This response rate of over 45% was highly encouraging, and was seen as justifying the approach used in the questionnaire design. Furthermore, 50% of respondents agreed to take part in follow-up interviews if contacted.

2.3.2.2 The Follow-up Interviews

Easterby-Smith *et al* (1991) have suggested a number of reasons for using interviews as a method of primary data collection, all of which are relevant to the second stage of this research. These include:

- To validate and extend information given earlier (in this case on the questionnaire)
- To further develop an understanding of the respondents' perception/recognition of the issues (in this case the BPR initiative)
- To develop rapport for any future contact (in this case potential case studies).

The same authors point out that in terms of detailed methodology it is necessary to consider the extent to which the interviews should follow a structured approach, sticking to a line of questioning predetermined by the researcher, or alternatively be respondent led. It is also necessary to decide on the location of the interviews and in particular whether face-to-face interviews are to be employed or whether telephone or other communicating media can be used.

In this case, as regards the degree of structure in the follow-up interviews, it was decided that given the breadth of the investigation a degree of flexibility was required to reduce the risk of limiting the amount of information given by the interviewee. Hence, a semi-structured approach was used to conduct the follow-up interviews. This involved the researcher in preparing a working agenda to outline the direction of the interview. The key points on the agenda, in the form of opened-ended questions, focused on the purpose of the redesign process and the role of IS before, during and after the initiative. It was considered that a semi-structured method would help to encourage a more natural approach to the conversation and an opportunity for the interviewee to discuss finer issues pertinent to the topic at hand, thus enabling a richer form of data to be collected. Use of the semi-structured approached enabled the participants to look at the list of questions presented by the author at the start of the meeting, and discuss the issues with a degree of structure and order in which the questions had been posed. However, often responses spanned more than one question.

Robson (1993) defines semi-structured interviews as a situation "where the interviewer has worked out a set of questions in advance, but is free to modify their order based upon his/her perception of what seems most appropriate in the context of the 'conversation', and also he/she can change the way they are worded". Similarly Moore (1983) states that "semi-structured interviews provide much more scope for

the discussion and recording of respondents' opinions and views (than a closely structured approach)".

As regards the location and method of communication adopted, this was largely determined on a pragmatic basis given the number of interviews to be conducted and the location of the respondents. Over 50% of respondents (i.e. 30+) had agreed to a follow-up interview if contacted, but it was not practicable to interview them all in the time available. Instead it was decided to select a sample 20, with at least four from each of the areas of Retailing and Services, Manufacturing, Banking and Finance and IT/Communications. This would give a spread of respondents across business sectors, and also meant that it would increase the possibility of identifying case study participants from different sectors. In practice, however, this meant that the interviewees were scattered across the UK, and this in turn affected the choice of interview location and technique. Cost factors determined that face-to-face interviews were possible only within Southwest and South-Central England, and telephone interviews were the cost effective approach elsewhere. Some of the respondents were therefore interviewed face-to-face depending on their geographical location and time available, and other individuals were interviewed over the telephone. Each method proved successful, and there was very little difference between them in terms of the amount of data gathered.

Face-to-face: Since their contribution was greatly appreciated the author agreed that the interviewee should set the time and location of the meeting. This was often the interviewee's normal office location, which had the advantage of giving the researcher first hand experience the working environment that they were representing. In other cases the interviewee made certain efforts to consider possible alternative office locations, nearer the researcher's place of work as the venue. In all cases the final decision lay with the interviewee. The interviews were scheduled to last one hour, with the interviewee being made regularly aware of the time, and in practice they lasted between 40 minutes and just over one hour.

By telephone: Robson (1993) suggests that the main advantages of telephone interviewing technique especially with a geographically dispersed population is "lower cost in terms of time, effort and money." He further suggests that "rapport may

be difficult to achieve but this is compensated for by evidence of smaller interviewer effects and a lower tendency towards socially desirable responses". In practice it was evident that some interviewees preferred to be interviewed by telephone and found it easier to adjust their schedules for a pre-arranged call. Arrangement of time for the interview was more flexible as venue was not a limitation, and there was greater flexibility, when needed, to re-arrange the time of the interview without too much inconvenience to the interviewee or the interviewer, as neither party had to travel for the interview. Indeed one of the most successful telephone interviews had to be re-arranged several times. The interviewee in this example was the Head of Information Management of a car manufacturer firm who had originally agreed to a fifteen-minute interview over the telephone. Following several re-arrangements the interview finally took place at the end of the working day and continued for over 45 minutes. This experience proved to be very successful as the interviewees felt relaxed and comfortable to discuss their experience of BPR and their specific role before, during and after the initiative. The average telephone interview lasted 35 minutes and produced an equal amount of output to the face-to-face interviews.

In all 20 follow-up interviews were conducted, 6 with representatives of the Retail/Services/Utilities area, 6 from Manufacturing/Automotive and Chemicals, 4 from Banking and Finance and 4 from the IT/Communications sector. Participants at this stage of the data collection were asked if they would be willing to further participate in the case study data collection stage. Eight organisations agreed to take part in a further stage, and four companies, one from each sector, were selected.

2.3.2.3 The Case Studies

The final stage of primary data collection in this research used a case study approach where four of the participants took part in a more in-depth investigation of their activities before, during and after their BPR exercises. This was achieved by conducting in-depth interviews with a senior IS professional and a senior business professional in each of the organisations and by studying written material provided by the participating organisations.

Prior to this stage an initial understanding of the change process and the degree of involvement of the ISp in each company had already been gathered through the questionnaire results and the follow-up interviews. The purpose of the case studies, therefore, was to:

- Validation and confirmation of earlier findings in the research
- Provide in-depth insight into the role of IS from both perspectives of IS specialists and the users
- Probe the relationship between ISps and users as the BPR process evolved
- Investigate the expectations which each party had of each other before, during and after the BPR exercise

The use of case studies at this stage of the research is consistent with the researcher's belief that the subject matter is best suited to an interpretative, exploratory, phenomenological approach rather than a positivist one.

Walsham (1996) in delineating his approach to information systems research advocates these interpretative methods. He further discusses the use of case studies in this context: "if one adopts a positivist epistemological stance, then statistical generalisability is the key goal. However, from an interpretative position, the viability of an extrapolation from an individual case or cases depend not on the representative of such cases in a statistical sense, but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them".

The use of a case study approach is also supported by Remenyi et al (1998), who define case study approach as "a way of establishing valid and reliable evidence for the research process as well as presenting findings which result from the research".

Yin (1993) recommends a case study as "the method of choice when the phenomenon under study is not readily distinguishable from its context". He suggests that such a phenomenon may be a project or programme in an evaluation study. He also states that "one of the original motives for using case studies was to study individuals or

small groups of people in-depth". Both of these comments support using a case study approach in this research for the purposes of collecting more in-depth data.

However, there are certain implications in using case studies that the author has been conscious of in conducting the final stage of data gathering. Yin (1993) summarises some of these issues in the following three areas:

- "The richness of the context means that the ensuing study will likely have more variables than data points."
- "The richness means that the study cannot rely on a single data collection method but will likely need to use multiple sources of evidence."
- "Even if all the relevant variables are quantitative, distinctive strategies will be needed for research design and for analysis."

By using a multi-stage approach to data gathering the current research has addressed the second and third of these points. By accepting that the viability of the research depends both on the data collected during the interviews and on their interpretation, and particularly through the avoidance of unproven generalisation of results, it is suggested that Yin's first point has also been allowed for in the design.

Yin (1993) suggests that a 'good' case study design should address five issues:

1 Articulation of the research objectives and questions.

This was done at various stages prior to the case study interview. The questionnaire was sent with a letter explaining the aims and objectives of the research. Although the follow-up interviews were mainly arranged over the telephone, at the start of each meeting/conversation the participant was updated with the research objectives. This was especially important when in some cases the respondent to the questionnaire and the follow-up interview were not the same due to changes in the position of the participants.

2 Linking the aims and objectives of the research to the cases involved.

During the case study interviews the author reflected on data already gathered from the organisation, in addition, similar relevant points that had been discussed at other

case interviews were reflected without jeopardising the identity of the organisation in any way.

3 Identifying the critical evidence.

The author was very diligent in the formally recording of key statements and expressions during each interview.

4 Stipulating techniques for analysing the data obtained.

All the participants were made aware of the way in which their input would be analysed and used.

5 Providing clear direction for generalising potential results.

Through the interviews the author asked clarification questions to ensure any assumptions made by the author were reasonable. The provision of definitions of terminology also proved effective in ensuring clarity of meaning. The choice of participants from different industrial sectors was also an aid to gaining a wider view of the relevance of the information, although generalisability per se was not a primary objective of the research.

The focus of the interviews during the case study stage was upon the core question of the research, namely to establish whether, and if so how, the role of ISps evolves during BPR initiatives. The interviews were therefore structured in order to cover the following points:

- Understanding of the term ISp
- Perception of the role of ISp
- Present role of ISp
- How different to pre-PR
- Expectations from ISp/users
- Relationship between ISp and users
- Future role of ISp

The approach to the interviews, as with the earlier follow-up interviews was semi-structured. The interviewees were aware of the topics to be covered but were not

restricted to them, or to the sequence in which they were covered. The same structure was used when interviewing the IS Specialists and the User representatives. All interviews were conducted on the company's premises. Separate interviews were conducted with the two respondents (IS/Users), except in one case where the identified user contact left the company, so a single person, who had significant experience of the project as they had performed both roles at different times, was the sole interviewee. The interviews lasted at least an hour and averaged one and a half hours. They were also followed up were necessary by telephone conversations to clarify specific points. All participating case study companies proved to be extremely co-operative throughout this stage.

The structure used in the interviews also proved relevant in analysing the written information which the companies had previously provided, and together this provided a very rich picture of the situation within the companies before, during and after their BPR initiatives.

2.3.3 Data Analysis Methodology

The data analysis techniques used at the different stages of this research were selected to reflect the research paradigm under which each stage was conducted and to appropriately complement the data collection methodology of that stage.

The Questionnaire

The first stage of the data collection, the questionnaire, was designed to be a descriptive survey (Hussey et al 1997) rather than an analytical one. As such, it was short and simple, consisting of ten closed-ended questions, for the reasons described earlier. There was no intention in the design to facilitate the identification of dependent, independent and extraneous variables. The purpose of the survey was to probe the organisations' general claims to have been involved n BPR, and to introduce the respondents to the research and establish their interest in future stages of the work.

Although statistical packages such as SPSS (Statistical Package for Social Sciences) were considered and used on trial data basis, it was eventually decided that a simple

frequency analysis of responses, displayed numerically as means, absolute figures and percentages, and graphically in the form of bar graphs is sufficient to portray the general messages which can be deduced from the questionnaire results. Generalisation beyond the set of respondents was not the intention of this part of the research, and a deeper understanding of the results was left to the subsequent stages. In the event, the questionnaire was believed to have effectively served its purpose as the results, as presented in Chapter 3 below, proved an adequate base upon which to move to the next stage of data gathering.

The follow-up interviews and case studies

As explained above, the second and third stages of the research emerged following the adoption of a phenomenological rather than positivist research paradigm, i.e. one which "seeks to understand the lived experience of individuals and their intentions within their 'lifeworld'" (Crabtree et al 1992). The Stage 2 interviews were tape recorded and then transcribed into written notes, arranged roughly under the headings used in the interview checklist plus an "others" category, although no attempt was made to restrict comments to one of these headings.

The case study interviews were also recorded on tape and then transcribed under the general headings used to structure the interviews, but again with no attempt to restrict the comments to one heading and with the provision of an "others" section. Information gleaned from the literature supplied by the case study participants was reviewed and categorised in the same way as the case study interviews.

The NU-DIST (Non-numerical Data Indexing, Searching and Theory-building) package was investigated as a possible means of analysing the transcripts from Stages 2 and 3 of the research. A currently popular analytical aid in business research, this computerised tool uses a hypertext approach to help organise and analyse text. The researcher familiarised herself with the use of the package, and discussed its strengths and limitations with other researchers who had used it, some successfully and some less so.

In fact, after a trial on actual interview data, it was decided not to subject the full texts to analysis using NU-DIST, but rather to use an iterative manual annotation approach

for combining responses and drawing the major themes from the texts. The reason for not using NU-DIST can be summarised as :

1 Time taken to code the text not matched by resultant value added.

Rubin et al (1995) argue that "...the computer cannot do the creative part of coding, such as setting up and modifying the categories and figuring out it what categories each segment of an interview belongs. Nor can the computer label ideas as concepts or recognise themes, compare the separate concepts, find subtleties in meaning, or follow up on comparisons or nuances. Computers can take much of the drudgery out of coding a large data set, but any claims for a computer software package that it can think for you are exaggerated." Since the primary purpose of interview data analysis for this research was to draw out such concepts and themes, and since the semi-structure interview format had already taken much of the drudgery out of the coding, it became apparent from the trial that in this case NU-DIST was neither time efficient nor adding insight to the findings. It was therefore decided that a manual system of text analysis is used.

2 Screen-based text limitations versus paper-based text.

The researcher found that using screen-based text inhibited viewing all the pages at once for cross-referencing. Some of the key constrains involved:

- the screen size restrictions pose a problem;
- screen-based documents are more difficult to use if one needs to look at more than one document at a time;
- it is more convenient to establish any cross-references between the information from each interview on paper than on the screen.

Given the need in this research to cross-reference between a large number of interviews (twenty at Stage 2 and seven at Stage 3), these limitations proved significant. It should be stressed, however, that NU-DIST's limitations are not seen as relevant to all types of research. In a project with fewer and less structured interviews it is recognised that the tool may well prove to be effective.

Grouping and presenting the results

Since this was essentially an exploratory research exercise, entering a new area when BPR itself was a new phenomenon, it was difficult when the research began to accurately assess the level of participant interest which would be achieved. The initial mailing list of 131 companies was, however, chosen to include a wide range of types of organisation, both public and private and a wide spread of sectors in the hope that a variety of respondents would be forthcoming. In fact the questionnaire achieved a 45% response rate, and half of the respondents were willing to be involved in further discussions. It therefore became apparent that the researcher would have an opportunity to select participants for the later stages of the work, rather than have to take all who wished to be involved. At this point it was decided to ensure that participants in Stage 2 and, if possible, Stage 3 would also represent a range of sectors. Although sectoral comparisons was not, and is not a primary objective of the research design it is believed that maintaining the participation of a variety of organisations throughout the research has added meaning to the results, without the researcher wishing to retrospectively assign any statistical significance to the variability between sectors.

After studying the questionnaire responses the following groupings were devised:
Group A: Disd+Gov+Retail+Services+T&T+Util. (n=12)
Group B: Auto+Chem+Cosmetics+CPG+Man+Petroleum (n=16)
Group C: Banking and Finance (n=16)
Group D: IT+Telecoms (n=8)
Unknown (n=8 of 60 initial questionnaire responses).

Figure 2.2 shows the number of participants in each group at each stage of data gathering and analysis.

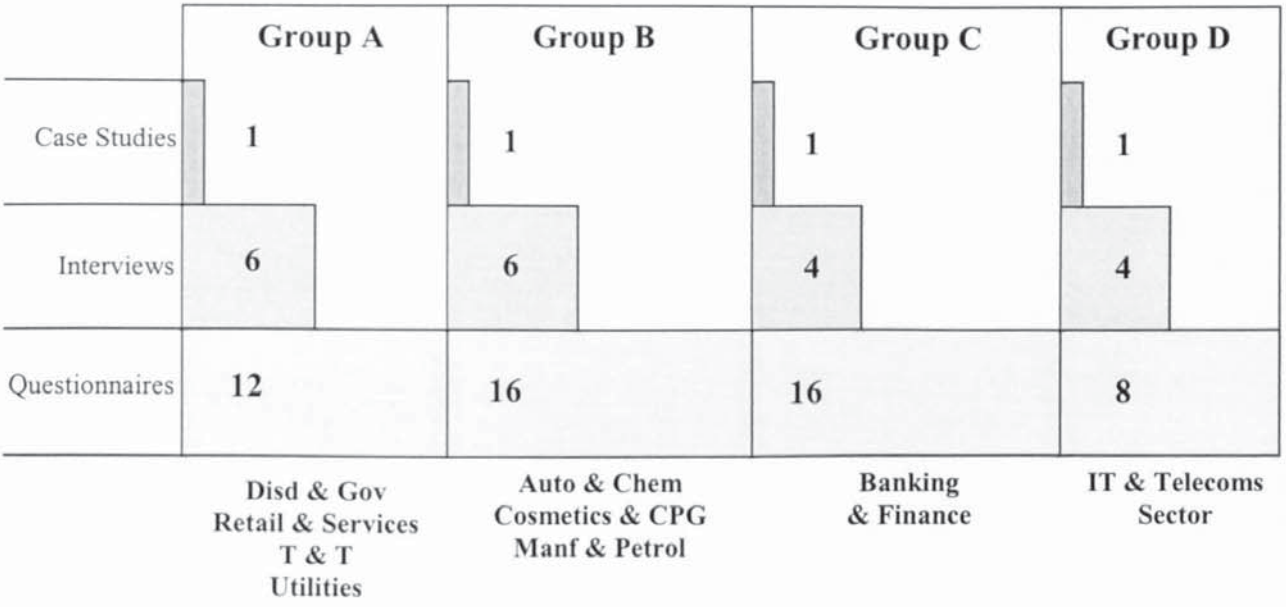

Figure 2.2 Data Analysis Structure

The groupings are used in presenting the results of data analysis in the next three chapters, primarily as an aid to presenting the findings in a digestible format. Secondarily, however, it is believed that the apparent similarities and differences between the groupings, whilst not subjected to rigorous statistical validation, may perhaps act as a starting point for further work designed specifically to investigate sectoral difference in the future.

2.4 CONCLUSIONS AND LESSONS LEARNT

The following diagram (Figure 2.3) depicts the stages involved in conducting this research and the relationships between these stages.

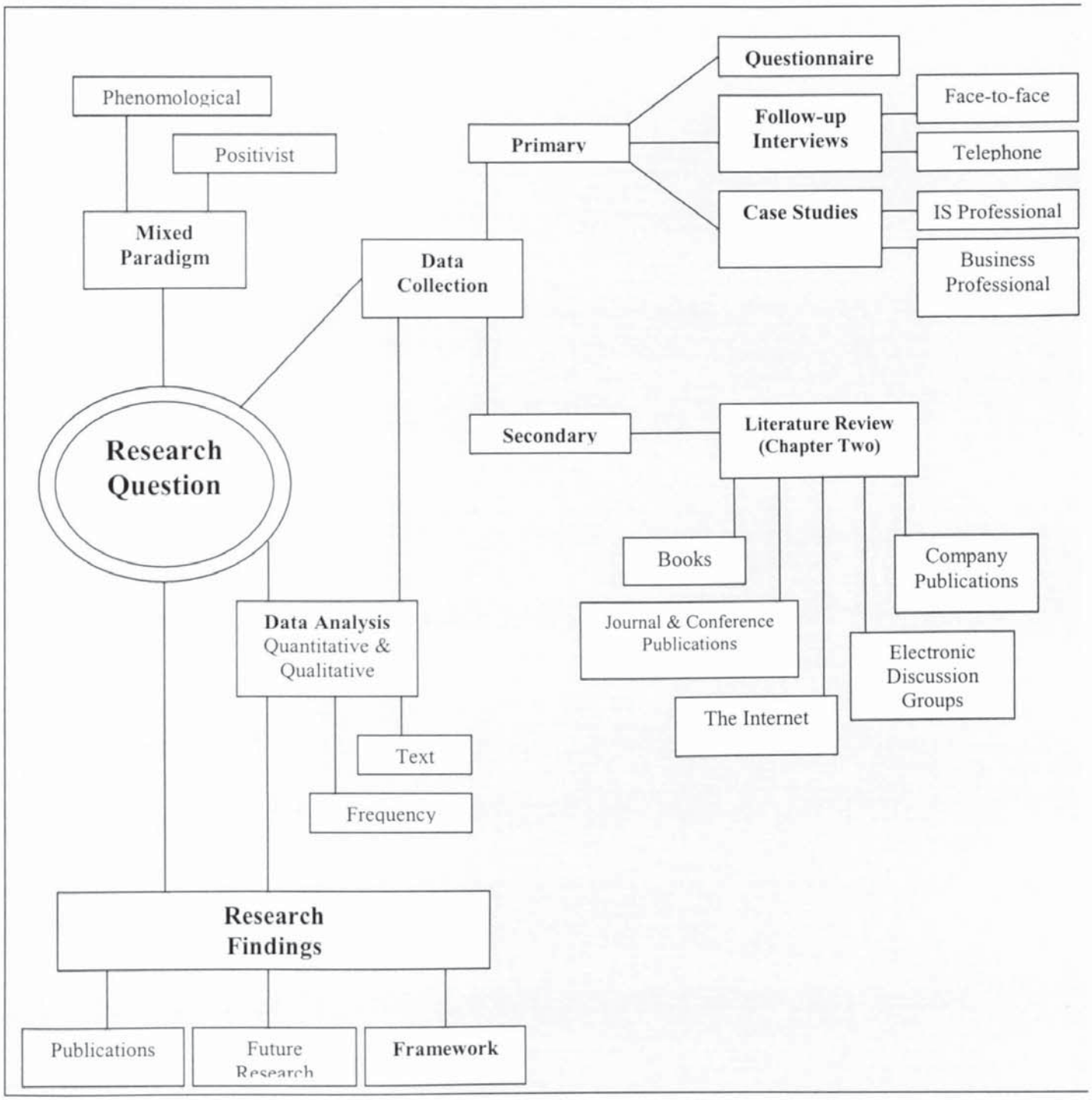

Figure 2.3 An Overview of the Research Methodology Adopted

The nature of the research question led the researcher to adopt a mixed paradigm, part positivist and part phenomenological. This in turn suggested a multi-stage approach to primary data collection, using a simple, closed-ended questionnaire followed by semi-structured interviews of key actors and the analysis of original written material gathered from participating companies. The mixed data collection methodology in turn led to the adoption of a mixed data analysis approach, with simple quantitative

analysis in Stage 1 leading to qualitative analysis and summarisation of Stages 2 and 3 data.

Overall the author believes that the chosen methodology has proved appropriate to the investigation of the research question and hypothesis. There are, however, a number of specific lessons which have been learned. In particular:

- One of the key lessons learnt in the survey was the omission of a section in the questionnaire to indicate the respondents' contact details. As a result a further set of questionnaires had to be posted, to a further set of organisations, shortly after the original set was posted. In fact many respondents from both postings included business cards or a compliments slip that indicated the organisations' identity. This suggests that anonymity may have been less of an issue with respondents than was expected.

- One of the main challenges in conduction the follow-up interviews was to arrange times for face-to-face meetings. With hindsight, given the effectiveness of telephone interviews, more Stage 2 interviews could have been conducted over the telephone to help minimise the elapsed time of Stage 2 and the actual time taken to speak with organisational representatives.

- There were both positive and negative experiences from the case study approach used:
  - The agenda presented at the start of each interview ensured that all areas were covered in the time available;
  - Having a copy of the questionnaire to remind respondents of previous information given was important;
  - Asking the first contact (usually the IS professional) to suggest a contact in the business/user professional as a potential contributor proved effective;
  - The transcribing process was time consuming, especially when the quality of recording proved poor because of the distance between the tape recorder and the speaker and/or the loudness of the voice of the speaker.

- Since the research was conducted on a part-time basis, the time gap between the initial contact and the case study interviews was lengthy and in one case this led to the "loss" of the user participant and reliance on input from a single individual.

It should be stressed, however, that these are regarded as relatively minor issues and that the author considers that general structure of the research methodology proved appropriate and sound and that the results of the research and the conclusions drawn in the next three chapters represent a valid and rich insight into the evolving role of ISps.

Chapter Three

Questionnaire Data Results

3.1 CHAPTER INTRODUCTION

For the purposes of this research a questionnaire was used as an introductory tool to gather initial information regarding participants' degree of involvement in, and approach to, their process redesign initiatives. It was also used to gain information on the level of involvement of IS professionals at the earliest stages of the change initiative. The questionnaire also asked respondents whether they were willing to participate in further stages of the research.

The primary aims and objectives of the questionnaire are thus as follows:

- Confirm that the respondents were appropriate
- Introduce the research to respondents
- Gain an initial feeling about the role and involvement of ISps in BPR

Appendix A contains a copy of the original questionnaire and tabulated raw results for the ten questions and their sub-sections. This chapter presents the findings of the questionnaire survey and demonstrates a critical evaluation of these findings. Results are presented and analysed in relation to all 60 respondents as a single group and also in relation to the sub-groups described in Chapter 2 (Table 3.1):

Categories	Industry sectors	No. of participants
Group A	Disd+gov+Retail+Services+T &T+Util	12
Group B	Auto+Chem+Cosmetics+CPG +Man+Petroleum	16
Group C	Banking and Finance	16
Group D	IT+Telecoms	8
Unknown	Not able to identify	8

Table 3.1 Industry Sectors: Categories and Sub-Groupings

3.2 QUESTIONNAIRE ANALYSIS

Question 1.

Are you currently undertaking any process re-engineering initiatives?

Y/N If 'Yes' which of the following best describes the initiative?

One or more specific processes [ ]
Organisation wide, all processes [ ]

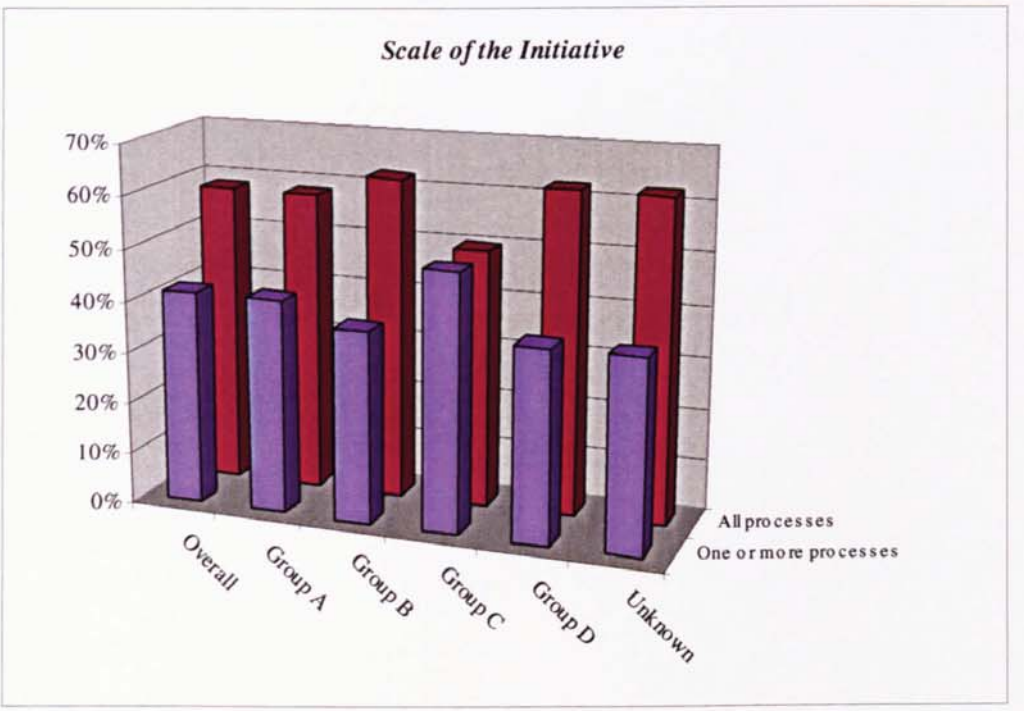

Figure 3.1

The first part of the initial question was used to validate the fact that respondents considered themselves to be (or to have been) involved in a business process re-engineering initiative. In fact all 60 respondents confirmed this to be the case and no responses needed to be rejected at this stage.

The second part of the question was designed to be a relatively gentle introduction to the questionnaire, based on an 'either/or' response. It addressed the general question of the scope of the BPR initiative. Overall, 60% of respondents regarded their BPR work as addressing organisation wide processes, with the remaining 40% preferring to categorise the re-engineering as having more limited scope. This ratio was consistent across all industry groups except Group C (Banking and Finance) where the ratio was 50/50.

Question 2.

To what extent are these initiatives intended to impact on the performance of the business? Where '1' describes basic tidy up of the current processes and '6' describes major redesign for radical performance improvement.
Please circle appropriate figure.

1 2 3 4 5 6

Question 2 probes the perceived magnitude of the change exercise, using a graduated scale ranging from "tidy up" (1 point) to "radical redesign" (6 points).

The results are quite striking both in terms of actual scores and consistency. Across all categories combined the mean score was 5.1 out of a possible maximum of 6.0. The individual sectoral groups ranged from a high of 5.3 in Group B (Manufacturing) down to 4.4 in Group D (IT and Telecoms.). This indicates that the vast majority of repondents were looking for substantial business improvement, irrespective of whether they were taking an organisation wide approach to BPR or concentrating on a more restricted set of processes. Group C (Banking and Finance) recorded a score of 4.9 despite more restriced view of re-engineering as expressed in their answer to Question 1.

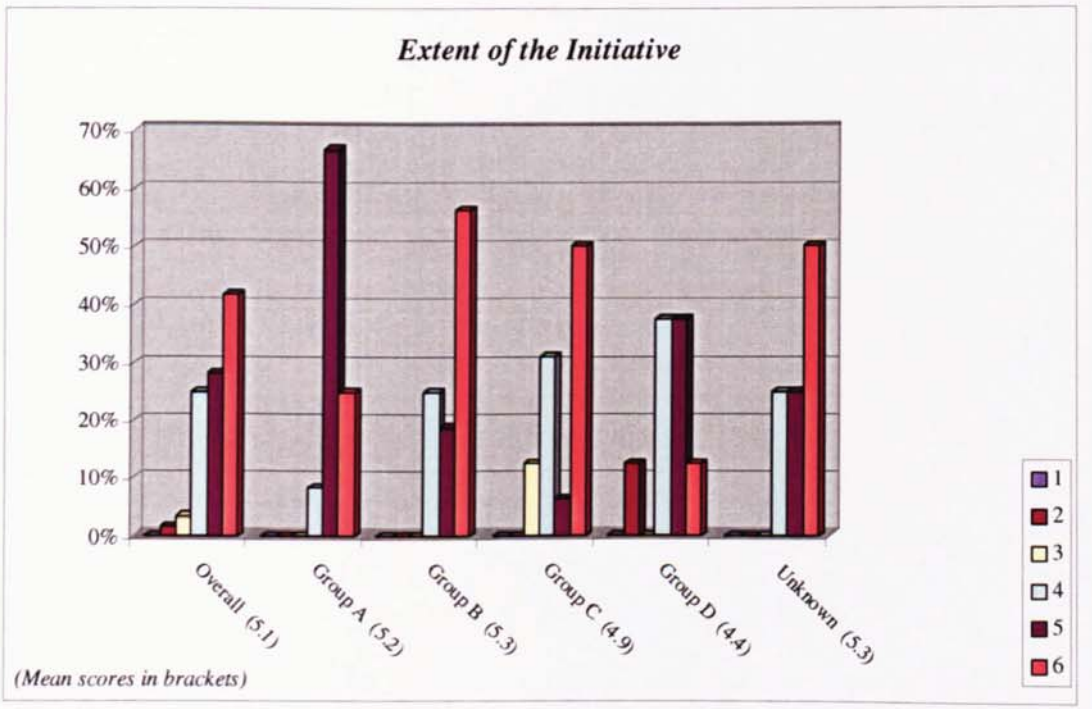

Figure 3.2

Question 3.
Which dimensions of performance are you seeking improvements in?
(Multiple entries are acceptable)

a) Work processes [ ]
b) Information flows [ ]
c) Decision / authority structure [ ]
d) Organisation structure [ ]
e) Others [ ] _____

This question probed further into the nature of the expected performance improvements, using the four dimensions of change identified by Hewitt (1994).

Overall the most common dimension addressed by the BPR initiatives was Work process redesign (<90%). This was followed by revision to Information flows (<80%) and Organisational realignments (<70%). As predicted by Hewitt (1994), the dimension attracting least attention in re-engineering activities was the Discussion/Authority process within the participating organisations.

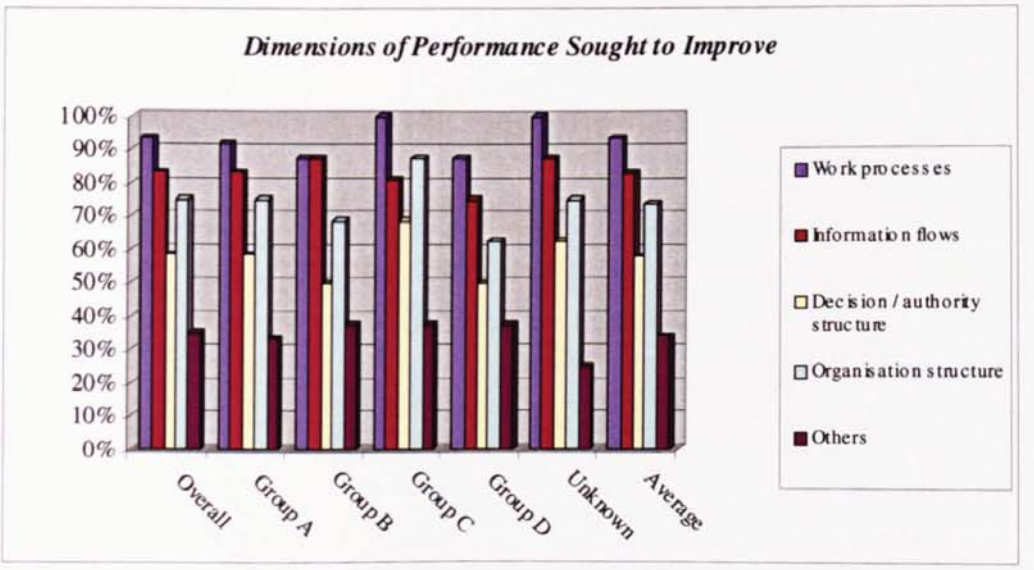

Figure 3.3

In Group D (IT and Telecoms.) almost all respondents sought improvements in work processes and information flows. Perhaps this is not surprising since the organisations involved in this category are from sectors of industry that have proved to be more

aware of the capabilities of technology. Results from Group C (Banking and Finance) were similar, except for a higher proportion of companies/respondents also aiming for improvements in organisation structure, with Information flow relegated to be a third priority.

Responses in the 'Other' category were relatively few, namely:
Group A – "product redesign"; "Cost effectiveness"
Group B – "Align UK/US processes to enable interactional systems to be developed"; "Cost performance"; "Performance of teams"; "Let the business run the system not the system run the business, make more activities routine and automatically carried out by the system to release users to demonstrate their true business talent"; "Major reduction in lead times, the second to new ways of managing our international supply chains"
Group C – "Staff rewards"; "Cost of external services/general customer service"; "Customer focus"; "Nature of information used to drive business"; "Cost reduction principle driver"
Group D – "Revenue generation, profit maximisation".
The clear overall implication of the responses to Question 3 is that BPR was indeed seen as a multi-dimensional change activity. Virtually all participating organisations expected to achieve simultaneous improvements in many or all of the dimensions of change, including work flows and information flows.

Question 4.
How many functions are involved in the initiative?
a) One or two [ ]
b) Most or all [ ]

After the first three more general introductory questions relating to BPR, Question 4 begins to shift the focus of the enquiry towards questions probing the involvement of a variety of different actors within the re-engineering initiative, prior to moving on to specific questions related to ISps. The question was also used to test for consistency with the answers given to Question 1.

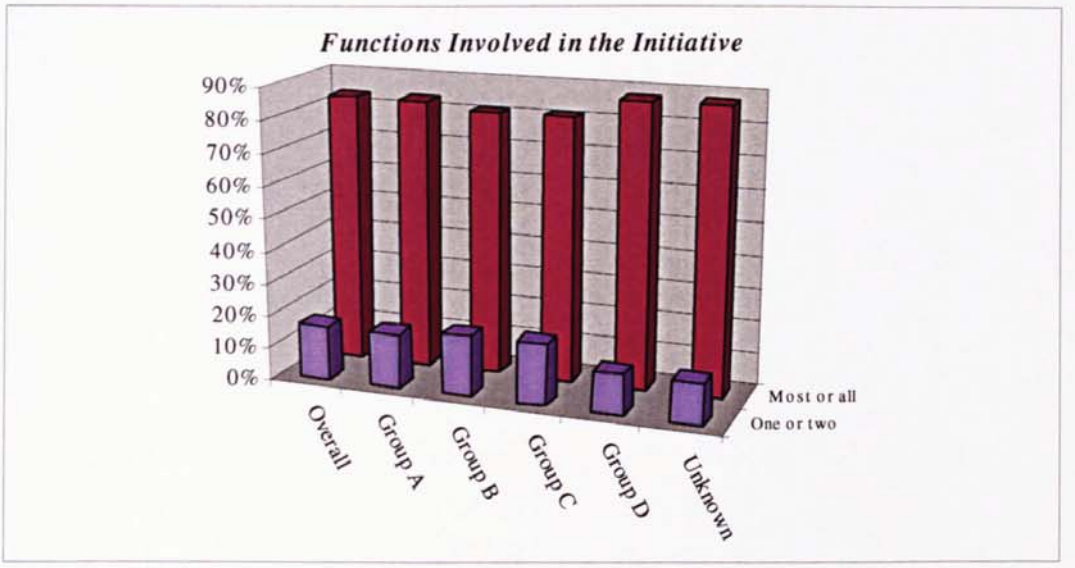

Figure 3.4

Over 80% of respondents indicated that most or all their organisational functions were involved in their initiative and results were consistent across all industry categories. This result contrasts somewhat with the response given in Question 1 of this survey, where only 60% of respondents reported "organisation wide" focus. Taken together the results may be suggesting that approximately 20% of respondents have most of their processes involved in the reengineering initiative rather than all of their processes. Alternatively, even where the focus is on a limited number of processes it may well be that these are cross-functional processes, thus involving virtually all functions.

Question 5.
Who has been involved in the setting up of the initiative?
(Multiple entries are acceptable)

a) Senior management [ ]
b) Departmental managers [ ]
c) IS strategists [ ]
d) IT management [ ]
e) IT steering committees [ ]
f) Internal customers [ ]
g) Others [ ] _____

In order to gain further understanding of the nature of involvement of different groups of participants at the initiation stage of the initiatives, Question 5 identified a number of potential participants, whilst also allowing respondents the possibility to write in "others".

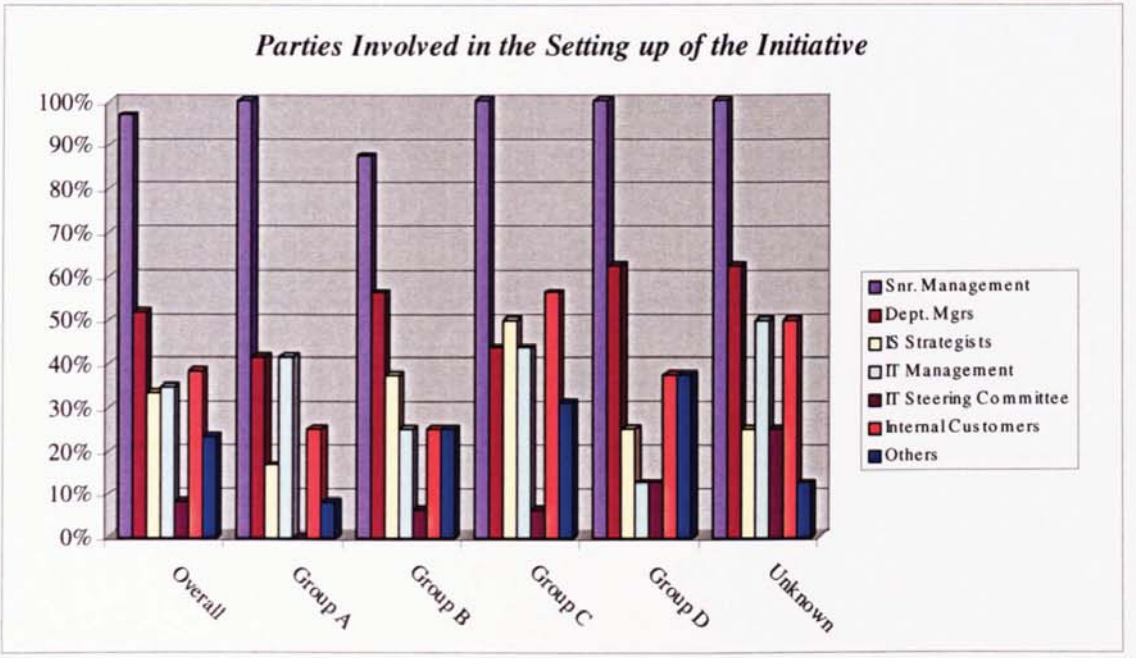

Figure 3.5

The most clear-cut response to any of the questions in the questionnaire was received in relation to this question. All but 2 of the 60 respondents identified "Senior Management" as having been involved in setting up the BPR project. The second ranked set of staff was Department Managers, being recorded as involved in 50% of the cases. The combination of Senior and Departmental Manager involvement represents a strong indication of BPR being initiated as a user-led rather than a technology-led exercise.

Of particular relevance to the current researcher was the fact that IS/IT personnel were reported as involved in the initiation of the activity in only one third of the cases.

Others quoted as having had a role in starting up the BPR activity were:
Group A – "Special task force"

Group B – "First stage initiated by IS strategists and internal customers, with senior management support, the second phase led grater business departmental management investment, the third and final phase (the real project) was initiated by senior business management assisted by external consultants"

Group C – "External consultants & IT specialists"; "Process improvement specialists; Owners of customer data"; "Marketing"

Group D - "Our customers and competitors"; "external consultants"; "[organisation's own staff] operating as consultants"; "Consultants"

It is noteworthy that the "consultant" group included ISps in two cases, but even with the addition of these into the IS/IT total the involvement of ISps remains below 40%.

Question 6.

Who are / were the change initiative programme owners?(Multiple entries are acceptable)

a) Senior management [ ]
b) Departmental managers [ ]
c) IS strategists [ ]
d) IT management [ ]
e) IT steering committees [ ]
f) Internal customers [ ]
g) Others [ ] _____

Question 6 moves respondents' thoughts on to the time at which the BPR project had been authorised. It asks them to identify the "owner(s)" of the change initiative, using the same categories of staff as the previous question, again including an "others" option.

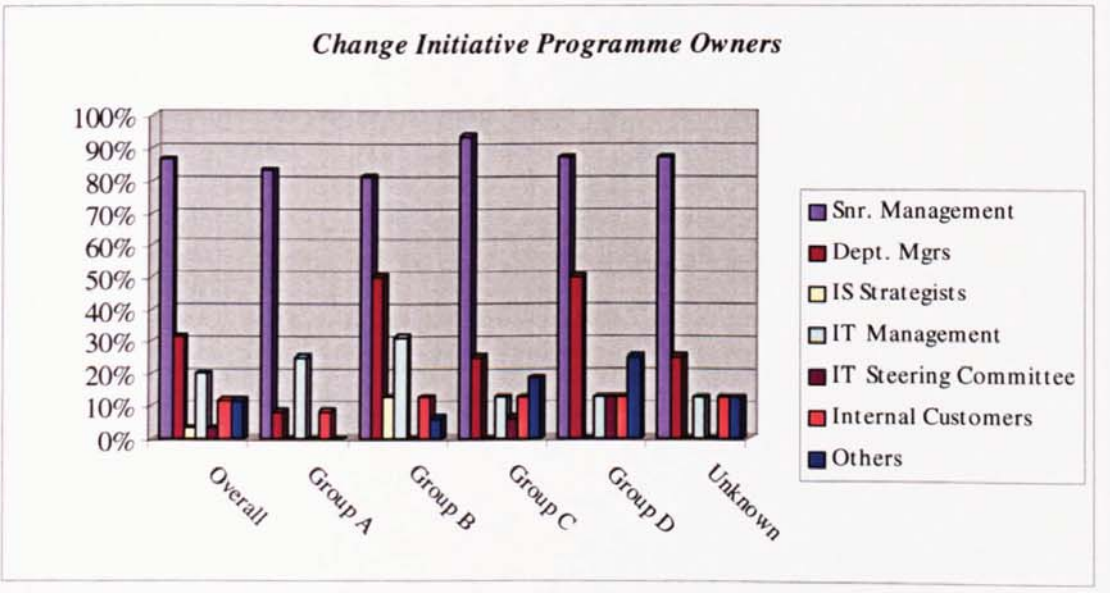

Figure 3.6

As with Question 5, in all of the Groups the Senior Management is by far the dominant programme owner, followed in categories D and B and to a lesser extent in category C by Departmental Managers.

The role of the IT/IS professionals is again seen to be minimal in terms of programme ownership. A possible exception is in Group B, but even here IT Management is indicated to be Programme Owner in less than a third of the cases.

"Others" identified as involved in project ownership were:
Group B – "New 'process' created – change management headed by a senior manager"; "The project sponsor is our manufacturing directors. Other directors and departmental managers are sponsors of various elements. The project is managed by an executive steering group (directors/department managers) and a programme management team (lower level business managers and IS managers)"
Group C – "Specific department established"
Group D – "process team change agents"; "All staff"
Unknown – "Dedicated change team".

Question 7
At what stage of the initiative were the IS team involved?
(Multiple entries are acceptable)

a) Start of the initiative [ ]
b) When solutions defined [ ]
c) Other [ ] _____

Question 7 is the first one to ask specifically about IS. To an extent it builds upon the and can be cross-referenced back to the "IS Strategists", "IT Management" and "IT Steering Committees" options in Questions 5 and 6. In Question 7, however, the focus is upon the time at which ISps were involved in the BPR activity, if at all.

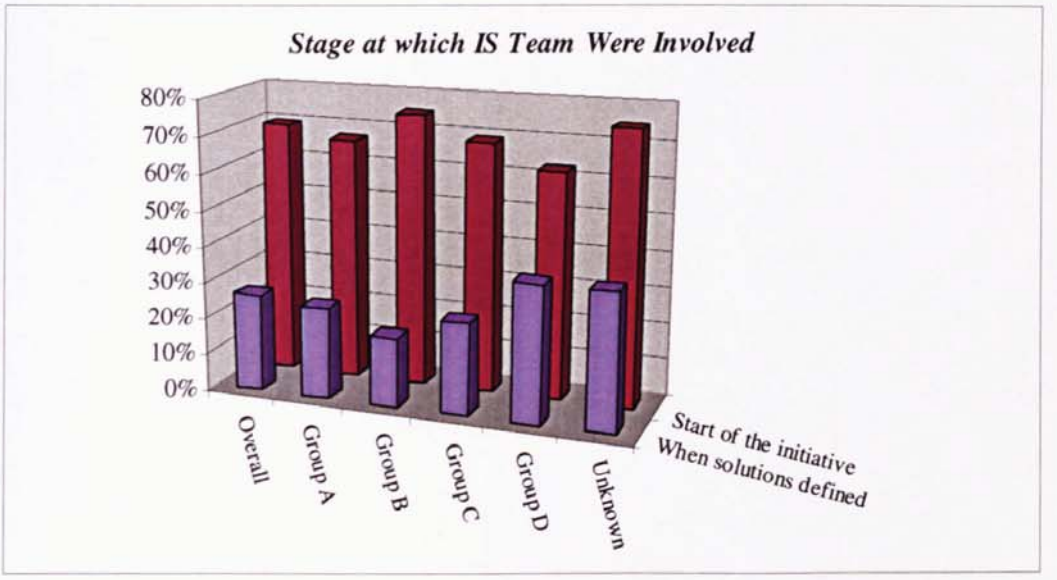

Figure 3.7

The results present an interesting contrast to those of Questions 5 and 6. In response to these earlier questions the role of IS personnel in initiating and owning the change programmes was portrayed as slight. When addressing the less demanding question of "involvement" rather than initiation or ownership, however, almost 70% of respondents reported early IS involvement. This result was similar across all industrial categories.

Approximately 20% of respondents noted IS involvement at the solutions definition stage. Interpretation of the meaning of this statistic is made difficult, however, by what the researcher now recognises as a lack of clarity in formulating the question. As stated, the question ignores the fact that some of the projects may not even have reached the solutions definition stage at the time the questionnaires were being completed. In such a case, IS involvement solutions definition would clearly have been impossible. This deficiency in the question became apparent from one of the answers in the "Others" category:

"The definition of IS solutions is generally being held back until needs have been fully defined".

Recognising this, one can only deduce that the figure of 20% of respondents indication IS involvement in solutions definition would almost certainly increase over time as more companies reached this stage of their programmes.

The "Others" option also yielded the following comments:
Group A – "Managed by non IT specialists"; "no such involvement"
Group B – "Part of business reengineering project team"; "Although IS involved from the start, the project run as a business-driven project. A small number of IS people are actively engaged in the project as facilitators/process analysts, and some enabling IS work is also being done. However, the department of IS solutions is generally being held back until the needs have been fully defined"
Group C – "All"; "not yet"; "when requirements are defined"
Group D – "Parallel implementation of SAP MIS product"; "when process critical success factors needed IT solutions"; "Not at all"
Unknown – "IT staff are involved on redesign teams throughout – formal IT solutions not defined before redesign solution"

As a whole the responses to Question 7 may be seen as modifying the rather minimalist view of ISps role as portrayed in the responses to Questions 5 and 6. Although not seen as either initiators or owners, IS professionals were generally seen as being involved in the change exercises, usually from an early stage.

Question 8.
Has there been a formal evaluation of any information requirements in terms of the following dimensions of the business?(Multiple entries are acceptable)

a) Process [ ]
b) Functions [ ]
c) Organisation wide [ ]
d) Internal customers [ ]
e) Others [ ]_____

Focusing further on the question of Information Analysis, and thus on the potential role of IS in re-engineering, Question 8 asked respondents to describe their approach to information requirements definition. Given earlier research (Hewitt 1994), and coincidentally the responses to Question3 although these were obviously not known at the time of formulating Question 8, one would expect to see a strong emphasis on

addressing the information needs of the organisation from a process-oriented approach.

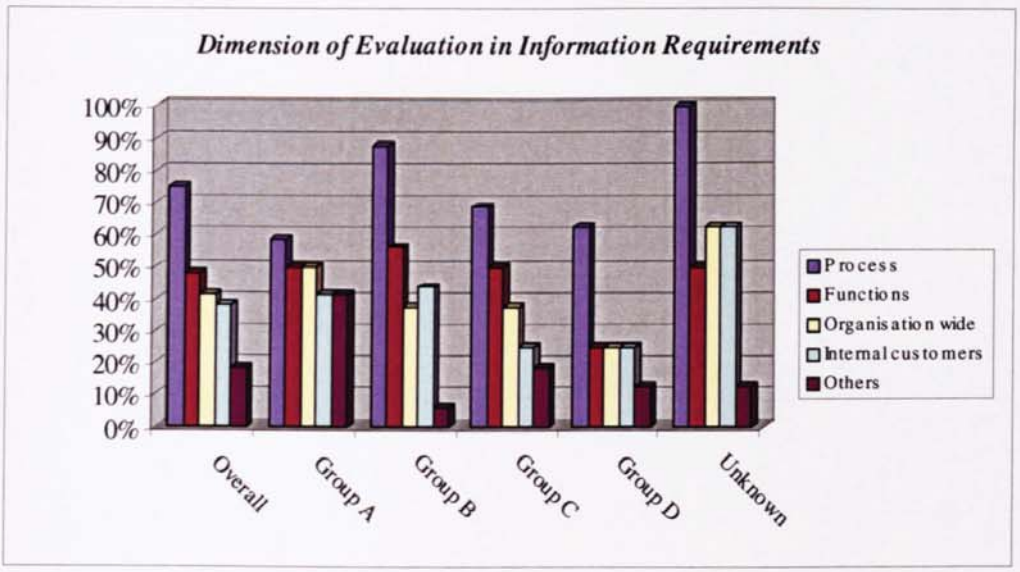

Figure 3.8

This is in fact confirmed in the responses by the fact that process orientation was recorded in 70% of responses compared with less than 40% reporting a functional orientation. It should be noted that the options offered were not mutually exclusive, but the fact that process orientation was the highest score recorded in each industry group does suggest cross-functional, process-oriented focus as being a key element of most of the programmes.

As with Question 7, hindsight suggests that more attention in formulating the question could have been paid to recognising that the companies would be at different stages of their BPR.

Some had not yet reached the stage of information analysis, as is shown by the responses under the "Others" option:

Group A – "Not necessarily IT"; "Not information driven"

Group B – "External customers"; "Not yet"; "External customers"; "Not yet. There is a good understanding of what the information requirements will be, but formal

definition will emerge from the various pilots of new ways of working which are currently in progress"

Group C – "Not yet"; "Access process – stress on external customers"

Group D – "External customers"

Unknown – "Customer to customer measures"

Having recognised this deficiency in the question, there is no evidence that the minority of companies still to reach the information analysis stage would approach it differently from the majority that had, and it is reasonable to interpret the responses as loosely indicating a process-orientation.

Question 9.
What solutions are being used / planned?
(Multiple entries are acceptable)

a) None yet identified [ ]
b) Groupware applications [ ]
c) Document management systems [ ]
d) Workflow applications [ ]
e) Client-server architecture [ ]
f) Distributed databases [ ]
g) LANs [ ]
h) Other [ ] _____

Although this research addresses the role of ISps rather than the technology used within BPR, it was thought appropriate to include one question which was related to technical solutions. The purpose of doing so was to gain further insight into the nature of the BPR exercises rather than to delve deeply into the technologies per se. It should be remembered that at the time of the fieldwork new technologies were emerging in the area of integrated ICT, and much of the research literature speculated about the possible implications of these emergent technologies.

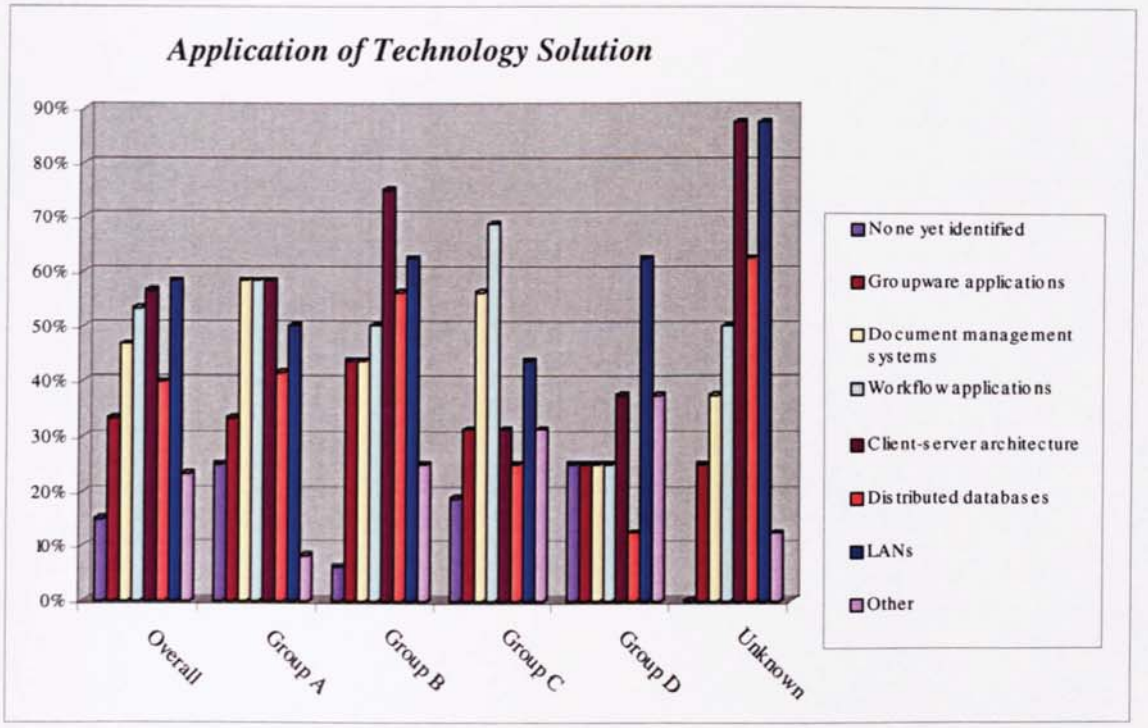

Figure 3.9

The approach taken in Question 9 recognised the fact that some companies would not yet have reached the point of choosing technical solutions. In the event 15% of respondents indicated this to be the case.

The results from the other 85% show a picture of widespread uptake for integrated ICT. Local Area Networks (LANs) were being deployed in a majority of cases, as were client-server hardware solutions, sometimes but not always associated with distributed databases. In terms of applications, workflow applications were the focus of attention in more than half the cases, with document management and groupware applications also being rolled out.

"Others" reported were:

Group A – "In-house development"

Group B – "Video conference"; "Planning (and are already doing the enabling work for) to use on ORB (object request broker) based middleware product to support information flow up and down the supply chain"

Group C – "New application system"; "CTI"; "CTI links"; "Gateway, Internet"

Group D – "ODBC, datawarehousing, stored procedures, EIS, transaction transfer technology, OOPS"; Overall policy is to install SAP MIS product"
Unknown – "Rules base, point of sale systems"

The overall pattern is consistent with the results of Question 3. The picture which emerges is one of the deployment of integrated, networked ICT solutions in support of re-engineering workflows and information/document flows. This is also consistent with the business process focus reflected in the answers to Question 8.

Question10
Do you have an IS strategy and planning process linked to the business strategy? Y/N

The final question in the questionnaire returns respondents' attention to thinking at a strategic level. Through a multiple part question it investigates linkages between business strategy and IS strategy.

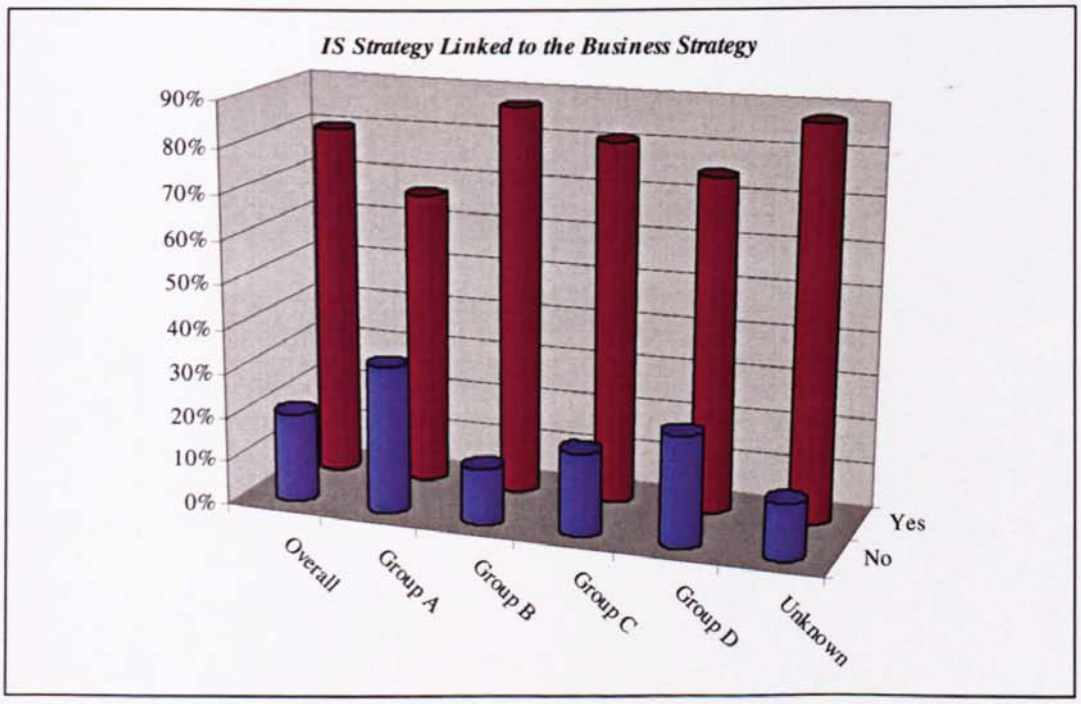

Figure 3.10

The first part of the question required a simple Yes/No to the overarching question of whether such a link was perceived to exist. A number of respondents indicated that no such link existed. 25% of respondents in Group D (IT and Telecoms) and 33% of respondents in Group A (Retail and Distribution) did not recognise a formal linkage of their business and IS strategies. Taking the returns as a whole across all industry groups in this survey the figure was just under one in five.

Those companies that did claim to link IS and business strategies were asked to give more details on how this was accomplished. The same categories of staff were used as in earlier questions, including an "Others" group, and two levels of responsibility, Primary and Secondary, were available:

If 'Yes'

i) Who is responsible for carrying out this task? (Please indicate the primary (P) and secondary (S) participants)

a) Senior management	[ ]
b) Departmental management	[ ]
c) IS strategists	[ ]
d) IT management	[ ]
e) IT steering committees	[ ]
f) Internal customers	[ ]
g) Others	[ ] _____

Interestingly, were linkages do exist IT/IS professionals are indicated as playing a primary role in the linking of IS strategy back into the business strategy. The role of senior management also highly as primary contributors, but individual departmental managers do not with the exception in Group B (Manufacturing).

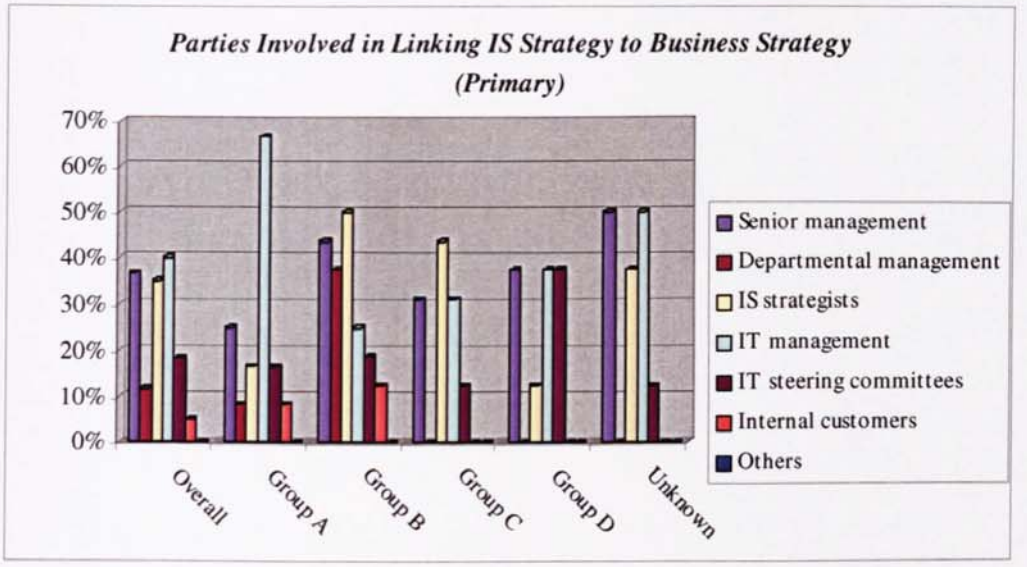

Figure 3.11

In terms of secondary involvement in linking IS and business strategies together, a clear consistency of approach emerges from the answers. Across all groups Senior Managers predominate in this role. Departmental Managers also assume a secondary role, scoring at almost the same level as IT Managers. One company indicated "Corporate Planning" as playing a secondary role.

Figure 3.12

The final part of Question 10 addressed the frequency with which the IS Strategy of participating companies was updated.

ii) *how often is the IS Strategy updated?*
a) Quarterly [ ]
b) Six months [ ]
c) Annually [ ]
d) In line with corporate strategy [ ]
e) Other [ ] _____

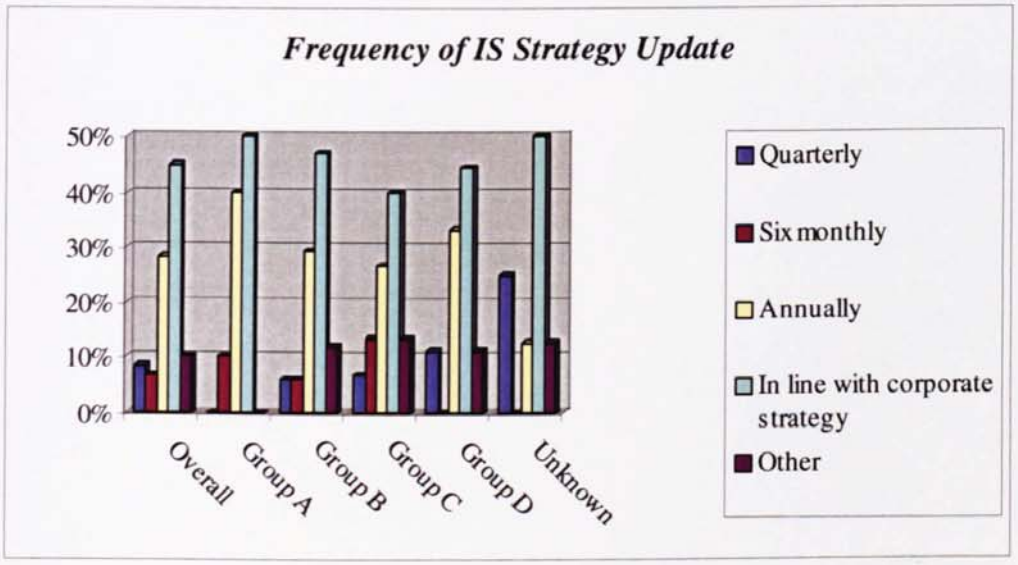

Figure 3.13

The results showed that where linkages do exist a high proportion of respondents indicate that IS is updated in line with the timing of the corporate strategy.

The next most frequent approach was to update annually.

Other comments were:

Group A – "Ad hoc"; "Currently ongoing since it is embryonic"

Group C – "As & when required"; "Still being finalised. Updated when required event triggered"

Group D – "As required"

Unknown – "3 year plan with annual updates"

3.3. Summary of Questionnaire Findings

The questionnaire responses provide useful information regarding what drives organisations to undertake BPR initiatives. They also represent a starting point from which to probe further into some of the key areas that need to be addressed from the ISp perspective, particularly in relation to the evolving role of IS professionals within these organisations.

All 60 respondents were undertaking initiatives which could validly be regarded as BPR. The majority of respondents in the sample involved in BPR were looking for organisation-wide process improvement, and this was evident across all sectors except the Banking and Finance sector, which had a 50:50 split.

Similarly, when looking at the impact on the performance of the business that companies were aiming for with their BPR programmes, it is clear that organisations do not enter such initiatives lightly. The vast majority were aiming for substantial performance improvement, with Groups B (Manufacturing) and A (Retail and Distribution) demonstrating the highest proportion of companies looking for these high levels of performance gain. This may, however, merely demonstrate that the companies in the IT & Telecoms and the Banking & Finance sectors were highly competitive and more advanced in their use of IT for performance improvements already.

When looking at the dimensions of performance in which companies were seeking improvements, it is evident that improvements in work processes and information flows were important to all respondents, regardless of industry sector. This is particularly interesting when linked with the number of functions that were involved in the initiative, where 'most or all' of the functions are highlighted by the vast majority of respondents, again regardless of industry sector. This demonstrates the cross-functional perspective that these organisations were developing, and growing consciousness of the need for information sharing across traditional organisational boundaries.

The responses to the questions concerning the setting up and ownership of BPR programmes indicate the predominant role that Senior Management played in sponsoring and owning BPR. This is consistent with prior research indicating Senior Management involvement as a key critical success factor, as already highlighted in Chapter One. The low level of IS/IT ownership demonstrates the 'business perspective' taken by the majority of respondents across all industries.

However, when it comes to the stage at which the IS team actually becomes involved in the BPR projects, it is clear that substantial numbers felt that this should be from the start of the initiatives. This perhaps demonstrates the beginning of an understanding of the role that IT could play. The clear message from all sectors, however, was that IS professionals were welcome to play a role in the change initiative, but were not expected to either initiate it or own it.

Consistent with the involvement of ISps was a general recognition of the need for information requirements to be evaluated as part of the change process. In the questionnaire, Question 8 invited comments on which dimensions of the business the change teams regarded as the appropriate focus for information requirements analysis. It is no surprise that the business processes perspective was pinpointed by the respondents as the dimension from which most have evaluated their information requirements. The second dimension by frequency of response was the more traditional 'functions' analysis, followed by attempts to take a holistic view of the organisation.

This recognition of the need for better sharing of information is demonstrated in the IT solutions being used, or planned to be used, by many of the respondents. Although a variety of solutions are indicated, holistic solutions rather than localised ones feature in most responses. For example local area networks, document management and workflow applications tend to get appear frequently in the responses, recognising the need for information sharing across organisations as they undertake and complete their BPR programmes.

In Question 10, on the subject of the linking of the planning process for the organisation's IS strategy with its business strategy, a significant number of respondents indicated no link between the two strategies. However, where there was a link, IT/IS professionals were indicated as playing a primary role in this linkage and appeared to be responsible for ensuring that the IS Strategy followed the business strategy and was updated as the latter evolved.

In summary, the key findings from questionnaires are:

- The majority of respondents involved in BPR were looking for organisation-wide process improvement.
- The vast majority were aiming for substantial performance improvement.
- Improvements in work processes and information flows were important to all respondents, regardless of industry sector
- 'Most or all' functions were involved in the BPR initiatives as indicated by the vast majority of respondents, again regardless of industry sector
- Senior Management played predominant role in setting up and ownership of BPR programmes
- Substantial numbers felt that IS team should be involved from the start of the BPR initiatives
- Information requirements were mainly evaluated from the business process perspective
- The IT solutions being used, or planned to be used, by the respondents indicate a preference for holistic solutions rather than localised ones
- Respondents saw the need for information sharing across organisations as they undertake and complete their BPR programmes.
- A number of respondents have indicated no link between the IS and business strategies. However, where there is a link IT/IS professionals are indicated as playing a primary role in effecting this linkage and ensuring that the IS strategy is updated in line with the corporate strategy.

- These key findings seem to be across all industry sectors, with few if any anomalies. This suggests that the key points mentioned are not dependent on the industry of an organisation, as there are common themes and practices across all.

3.4 The Effectiveness of Questionnaire as a Step to the Next Stage of the Research

On completion of the questionnaires it is important to review the effectiveness of this stage of the research in terms of the original aims and objectives.

In the beginning of this chapter it was explained that the questionnaire was used as an introductory tool to gather initial information regarding participants' degree of involvement in, and approach to, their process redesign initiatives. It was also used to gain information on the level involvement of IS professionals at the earliest stages of the change initiative. The questionnaire also asked respondents whether they were willing to participate in further stages of the research.

The primary aims and objectives of the questionnaire were indicated as being:

- Confirmation that the questionnaire respondents were appropriate
- Introduction of this research to the responding organisations
- To gain an initial feeling about the role and involvement of ISps in BPR

It was also the researcher's intention to use the findings to move from an initial broad questioning technique to a more focused and directed stage, namely the follow-up interviews and the case studies.

In this context therefore the questionnaire was a success, and each of the 60 responses was useful. Each added value to the whole, and there was an interesting level of consistency, even from different industries, confirming the validity of the questionnaire being used as a method for initial data gathering.

Half of the respondents were willing to give interviews. As many as time allowed (20) did in fact participate in the next stage. The questionnaire provided the knowledge of which organisations were appropriate targets for the next stage of the information gathering.

In addition, as has been indicated above, as far as the ISps' role is concerned there was evidence of a recognition of their potential contribution to BPR and the implementation of corporate strategy, but also a strong feeling that the ISps should neither initiate or own the strategy. However, when looking at responses to specific questions, there were apparent contradictions between Questions 5 and 7 and between Questions 1 and 4 which were very interesting, indicating that further investigation via interviews could prove to be valuable.

Chapter Four

Follow-up Interview Data Results

4.1 CHAPTER INTRODUCTION

This chapter presents the findings of the follow-up interviews. The objectives of the interviews were to validate and extend the information gleaned from the responses to the questionnaire. In particular further information was gathered on (Appendix B):

- The aim of the BPR initiative
- The role of ISps before the initiative began
- The role of ISps during the initiative
- The role of ISps after the initiative
- The future perceived role of ISps within the organisation.

Participants were made aware of these topics prior to the interviews, and they were used as a guide during the interviews, whilst care was still taken to provide interviewees with every opportunity to add their own input.

Over 50% of the participants in the questionnaire survey offered to be involved in a follow-up interview to help further discuss the issues raised in the questionnaire. Time and cost dictated, however, that a maximum of 20 interviews could be conducted. The time availability of interviewees and their location in relation to the interviewer's base of operations were factors in the final choice of interviewees. Once it was decided, however, that a combination of telephone interviews and face to face interviews was to be used, it became possible not only to identify 20 relevant participants but also to maintain a wide range of company types.

This stage of data collection continued to use the same group categories used in the questionnaire analysis. Each of the four Groups was represented by either four or six companies. In practice this grouping of companies also made the task of analysing the responses more manageable. Attempting to synthesis the responses of all twenty respondents in a single phase would undoubtedly have been more difficult. The results are presented firstly in relation to each of the four Groups independently, and then by topic across all groups.

4.2 GROUP A RESULTS - DISTRIBUTION, RETAIL AND SERVICES

Group A represents a set of categories where the prime activity is service provision. Company A1 specialises in a global express delivery service. Company A2 works in the area of postal services and to some degree the provision of financial services. Companies A3 and A4 provide utility services with a focus on different regions in the UK. Company A5 is part of a large UK sea transport company that also specialises in property services. Company A6 is one of the UK's largest motoring services providers.

Company A1

Aim of BPR

The company was moving from a completely decentralised to a more centralised administrative system. "Certain activities cannot be centralised such as shipping and billing; a package sent from Kenya to Greece needs to be despatched and billed locally". However, the transformation was needed to help with a need for a universally traceable and accessible delivery system. This need to share information resulted in the need to deal with issues relating to data ownership. "However, the customer service function is not integrated with, for example, the 'billing division' which may result in "misinforming the customer". The interviewee continued to describe that "in the past the information and the package moved together and the effort is now to have the information accessible from somewhere else as well". After the deployment the existing local systems for billing etc. would still need to exist alongside the universal tracking system.

A major challenge was the 'deployment system' which had "employed a great deal of capital". There were 96 countries involved in the rollout of the universal system and if it "takes too long for each to be incorporated then the investment is lost". Deployment had been country by country but at the time of the interview an alternative approach was being considered for a few countries to be deployed at the same time. It was believed that "this requires a lot of training - mainly technical, but also in the matter of data ownership, with the involvement of the users such as the customer service

agents". All of this aimed to ensure "information is available across the spectrum"; "for instance the field agents have PCs now enabling them to record and access information."

Role of ISp before BPR

The organisation had a number of separate systems to support such as the reporting mechanism, the billing system, courier equipment inventory control etc. The IT departments prior to BPR had been decentralised to the field units. There they were separated from the "business" functions and regarded as a process in its their right. In order to undertake the BPR exercise an international "Strategic Programme Office was created within the International Headquarters unit. The Strategic Programme Offices' role was to manage the process of implementing the new system on a universal basis.

Role of ISp during BPR

Initially the traditional IT departments were very much left out of the Strategic Programme's initiatives. This may have been explained by the fact that "since the case has not been getting rid of the old systems and bringing a new system, there has been a need for support of the existing system and develop a new one".

More recently, however, the IT function had taken more of a "central striker" role than before in the programme. This change in the approach was more of a cultural change than a technological change. The main change in focus had been to use IT in integrating all functions/processes, allowing the users to become more flexible and customer focused. It was only recently that the traditional IT department has been "brought in to be involved with the activities of the 'Strategic Programme'".

Role of ISp after BPR

All code writing, strategic and otherwise were out-sourced but it was stated that there was now a recognised need for the company's own systems integration activity. Nevertheless the IT department remains as a separate cost centre and the Strategic Programme Office continues as a different cost centre. The interviewee explained that "in this company everything is business driven". In this environment "all activities are paid for and controlled by the process managers." It was further stated that "there are 'integration engineers' responsible for integrating data and integrating the businesses. Also, there are 'course managers', 'quality managers' and 'procurement managers' who deal with contract agreements. There is a group dealing with training and the setting up of standards and introduction of "innovative ways of training which may involve outside support". The ISps from the IT area were involved in all of these activities, but still on an "as needed" basis rather than as initiators or process owners.

Anticipated future role of ISp

Given the company's increasing focus on process integration it was anticipated that the ISp will work ever more closely with the traditional business departments to ensure that the technology is a close fit of the business requirements as the needs of the business evolve. No specific plans were identified, however, that would see the ISps migrate into the business areas as possible leaders of future initiatives.

Company A2

Aim of BPR

The interviewee stated that there has not been a corporate BPR initiative, each business group was required to undertake its own BPR " and think cross-functionally".

The aim of BPR in this company had been to drive profit by reducing cost i.e. "setting prices". It was also possible that predatory mergers and take over bids might occur. Therefore, it was decided to "do what was needed before having it done to us".

Role of ISp before BPR

IT used to be responsible for automating operational level task activities. Workshops were run to demonstrate the types of new technology available as well as examining what the technology will look like in the future - five years time.
The organisation of these workshops was facilitated by external and internal consultants and by bringing IT specialists from the core teams. The IT support was focused on "identifying opportunities and weaknesses in current processes".

Some advanced IT products had already been tested in the organisation. This involved a technical review panel, including a group of representatives from the IT division within each project team. This had produced an approved product list. However, if the business manager decided not to have the product the there is no way that they could be forced to select it. There were a total of 26 improvement initiatives taking place within the company under the overall umbrella of its BRP programme. The main objective of the BPR programme as a whole was the "integration of the business units" and through this integration the achievement of a significant cost reduction.

Role of ISp before BPR

There had long been an IT director within the company which indicating the involvement of the IT function at the board level. Prior to the BPR change initiative the key role of ISp was to be involved in office automation. ISps were primarily technology-focused role ISp and were also involved in application development, IT support and systems training. There are 2000 people employed in the IT department/function. In the past systems were written and applications designed and developed in house. More recently there had been a willingness to use bought in packages.

Role of ISp during BPR

At the start of the programme it was considered important to use process mapping tools such as IDEF, however it was found that such sophistication was not always necessary and in some cases "post-it notes converted to ABC flowcharts proved sufficient". External consultants were brought in at a strategic level in a strategic overview to guide the project. At this stage the ISp were involved to help the process mapping activities, working with the external consultants. . Thus IT people have been involved from the start of the project. The change project team worked closely with the IT people from the start ensuring that specification are communicated effectively to the IT team. One person has been responsible for this communication and holding of workshops with the IT people.

During the two years of the BPR programme more IT people and business people had begun to appreciate the dialogues occurring in the different areas due to the increasing involvement of the IT people in the change programme. This was seen as the start of "creating a hybrid environment".

Role of ISp after BPR

Recent reorganisation studies have recommended that all non-strategic activities to be outsourced. A further external consultancy firm has been involved in guiding the company in this field. The IT function will remain and be responsible for providing IT support to all remaining areas of the business including the "core business which is dangerous to lose". However, the IT unit will be a profit centre allowed to conduct outside activities. The IT team will provide rechargeable consultancy to the internal business activities on matters related to process improvement. ISps are expected to become active in identifying BPR opportunities.

Anticipated future role of ISp

The experience of the major BPR exercise was that it was "not a good idea to attempt to correct several aspects of the business at the same time".

Also the interviewee expressed that opinion that "there are two issues which would have been handled differently: the even earlier involvement of the IT team and better communication across the different business units to minimise reluctance to change."

Recognising these messages, a mini BPR project is under way for the warehousing activities, examining the processes and other aspects of change. ISp are fully involved in helping with mapping of the new process and selecting systems to help enable further business expansion and integration.

Company A3

Aim of BPR

A3 is a utility company which decided to undertake BPR following its realignment, in common with other utility providers, as a regulated but profit generating activity. The interviewee explained that the organisation was "subject to regulatory review" and that it was necessary to "set targets and reduce costs, and as a result some drastic process reengineering was needed".

Role of ISp during BPR

The organisation had set up a BPR team of specialists involving professionals from: IT, finance, HR and analysts. The analysts were a mixture of staff from internal management consultants and external consultants who were brought in at the start of the change programme. The aim had been to progressively transfer the external consultants' skills to the internal professionals.

Process teams had been set up in each division. This exercise was said to be like "taking a vertical slice through the organisation involving managers, engineers and clerical workers". Each process team had 'asssigned responsibility' for a specific aspect of BPR. There was an IS member in each team. For each project there was a project board, including the main director and about six senior managers.

At the time of the interview the organisation was "quite a long way into BPR exercise" and the network division in particular was at the final ages of the programme after four years. It was stated that "identified benefits are now being reflected in the revenue figures". It was further stated that "other areas are not as advanced due to other non-BPR projects being implemented simultaneously", and therefore the difficulty of further changes being absorbed.

Role of ISp after BPR

There was no corporate IS strategy to set due to the fact that everything was decentralised, empowering the business managers to decide which opportunities are available. The IT team were in theory in charge of the IT architecture, nevertheless the businesses were provided with flexibility. This had not been successful in the past in that there had been a certain degree of duplication; there was a plan to limit duplication by promoting successful applications, "for example CASE tools used in R&D, project management tools including PMW and PM Project, and effective approaches to Internet usage".

There had been a shift towards "moving IT into the business". The interviewee stated that "IT managers cannot manage IT projects if they do not understand the business." It was suggested that there were problems with trying to get business people to do IT, "business professionals are not able to put forward their problems", on the other hand "the IT people do not always appreciate business problems". The previous IT head used to rotate people in business where individuals work in the shop floor and other parts of the business, however this proved to be a costly exercise.

Anticipated future role of BPR

The interviewee believed that as far as the future is concerned there were three choices:

- "Small central policy making group, managing issues such as outsourced contacts and R&D
- Still have the central group to advise and guide the division on using IT

- Doing nothing"

All options were still open, but the IT function was likely to remain as a cost centre and not a profit making unit. Thus the focus could continue to be on service provision and support of the business rather IT's own the profit margins.

Company A4

Aim of BPR

The organisation had been undergoing several benchmarking exercises against US companies. As a result, the organisation underwent a "de-layering" exercise, reducing the layers of responsibility from 14/15 layers to 6 or 7 layers.

Thereafter the company decided that BPR was a possible way of allowing it to move forward from a hierarchy structure to a process driven one. The change had been very 'traumatic' and the company realised "why some companies do not succeed".

One of the organisation's experiences had been that in order to get the BPR project agreed there was a need to have "the will at the top to do it". Once this was achieved external consultants were brought in to examine the best ways of progressing the BPR exercise.

Role of ISp before BPR

The key focus of IS prior to BPR was believed to have been "to support the existing hierarchy".

Role of ISp during BPR

BPR had been an important move for the company. The interviewee stated that "the organisation's fluidity changed a great deal". The company had invested a great deal in technology and training. Currently there was a "WAN infrastructure covering seven

locations with a LAN and 650 people working in the area". The company identified that it had had to "reduce costs of operating when putting the IT infrastructure in". It had also tried to replace staff and automate more activities. ISps had supported the BPR teams in achieving this. Integration changes had included: "different people having access to different parts of the system".

The technology aspects of the projects had sometime been a stumbling block. Problems included a lack of understanding of what is involved; lack of understanding of the cost and lack of understanding of the commitment required. It was stated by this interviewee that "one can destroy oneself if one gets these aspects wrong".

Overall IS had been involved throughout the project. However, "one needs to be aware of the implications and reminded that the project was not driven by IT as the IT professionals are not necessarily aware of the larger issues". Furthermore, it was emphasised that the project should not be led by any one specialised function as its key objective was one of integration.

Role of ISp after BPR

The organisation is now acknowledging that IT is a 'facilitator' and that BPR is about merging processes and the appropriate technology. The previous head of IT is now the BPR project senior. The company has set up "advice groups" to spot problems and opportunities and to flag them up. The focus is on supporting the business rather than the hierarchy. A danger is still perceived that "technology-based people get influenced by IT" but this is counteracted within the "advice groups" by "pushing forward the business in parallel with a leadership programme and cultural change".

Anticipated future role of ISp

It is believed that the future focus of ISps should be on the human resources factors involved in implementing change. The interviewee stated that "the main point is the people aspect, although technology can help in that respect".

Company A5

Aim of BPR

The proposition for a change initiative came from the IT director and was supported by the chairman and the rest of the board members. "This was done by getting the signature of the chairman and all the directors". The culture was "set there and then" and that all parties were expected to support the change. The change was organisation wide and the culture was for all to support it "if success was to be achieved". Key to success was the need for productivity in the property market and acknowledgement that the market was not stable. It was emphasised that the resultant IT system was always designed to support the businesses in this changing marketplace.

Role of ISp before BPR

The original information system had been developed mainly to provide basic factual information about the properties. It dated from 1979. It was a rigid functionally designed system designed and supported by in-house IT specialists. The user division it supported "was suffering from a lack of information and nearly went bust as a result".

Role of ISp during BPR

During the BPR project consultants were only brought in for technical support as well as some analysts and programmers from outside but the project had been managed by the company itself. Also, outside professionals were used for IT training. The internal IT department worked on a zero budget, with the IT involvement in the change programme being charged back to the project. This way it was believed that the focus would be on processes rather than technology. A plan of what the system "would look like" was presented to the chairman for his approval.

Role of ISp after BPR

There is now a culture within the organisation which recognises that " the new system had been proposed put together by the IT director and his team, but with full user involvement". The culture of the organisation and the attitude towards IT has changed to one in which "users, which include senior figures as well as operational levels, are IT literate and take interest in the systems and applications".

The next change initiative is also based on analysis initiated by the IT director and his team after consultation with potential users. The change project itself will, however, be user-driven and is to include multimedia technology for a more user-oriented environment. The supporting IT system is estimated to cost the company £8m, and this expenditure has the full support of all business partners who will be involved in using it. A large amount of money is also being spent on training in order to make users as independent as possible when the new process is implemented.

Anticipated future role of ISp

The immediate concern was to replace the whole system by 1999.
The IT director predicts that by the year 2007 the software and PC industry will have experienced new developments in large business process integration and he sees the demand for the future to be systems integration and not piecemeal BPR approaches. Within the company he envisages the role of the IT director and other ISps as becoming increasingly proactive and working towards global systems.

Company A6

Aim of BPR

The key aim of BPR in this company was focused on reengineering "the purchasing process and managing the preferred suppliers and subsequently how to structure tender".

Role of ISp before BPR

Within this company the traditional role of the IS function had been to provide technical IT support, initially based on mainframes and later PC based, and the development of computer based applications.

Role of ISp during BPR

During the BPR exercise the training aspects related to the new processes assumed a more important role. This involved the selection and deployment of appropriate user training tools and techniques. Ongoing problem analysis and support of business users became more significant. The focus was no longer solely on technical support.

Role of ISp after BPR

The role of ISps now is moving towards an overall emphasis on the role of technology in supporting the business strategy, although there is still a strong functional lead. However, the ISps are more responsive to business problems, choice of systems and empowering the user to develop/use the system.

The interviewed advised that "the ongoing involvement of the users is recognised as essential." He concluded by stating that that "there has not been a problem linking systems and technology people across the functions" and we are trying to address this problem.

Anticipated future role of BPR

IS strategists have not yet initiated any cross-functional BPR projects and there has not been a significant change to the IT department. In the future, however, as the company appreciates the power of cross-functional collaboration it is expected that the IS area will be asked to assume a more proactive role.

The following table illustrates a summary of the key points extracted from the follow-up interviews with the participating Group A organisations:

	Company One (A1)	Company Two (A2)	Company Three (A3)	Company Four (A4)	Company Five (A5)	Company Six (A6)
Nature of business	Express delivery service	Postal services	Utilities	Utilities	Properties	Motoring services
Aim of BPR	Improved information management and integration of customer services.	Integration of business units.	Drive profit by reducing cost.	Streamline processes. Reduce hierarchy.	Organisation -wide change for more productivity.	Improved purchasing process.
Role of ISp *before* BPR	Responsible for disparate back-office systems.	Office automation.	Automation of operational level task activities.	Support the existing hierarchy.	Responsible for office automation (and info. on properties.)	Technology support.
Role of ISp *during* BPR	Functional integration to enable more flexibility and customer focus.	Help with process mapping. Increasingly involved in change programme, creating a hybrid environment.	Identify opportunities and weaknesses. Technical review panels.	Supports achievement and maintenance of change. Integration projects.	Business system prototyping.	Problem analysis and user support, including training aspects.
Role of ISp *after* BPR	Ensure information available across the spectrum. IT now involved in Strategic Programme.	Organisation-wide support and consultancy.	In charge of architectural changes, but with flexibility. (Not been successful in past. Duplication.) Business and IT divide being reviewed.	Technology is facilitator, but BPR is about organisations (IT is 2nd). Small IT groups set up for each division. Disparate style to focus on support of the business rather than hierarchy.	User–driven. Focus on adding value to business and empowering users.	Overall handling of strategy in technology.
Anticipated *future* role of ISp	Become more part of the business activity.	Process redesign.	Central control. Advice on moving IT to divisions.	HR & people issues. Proactive problem detection.	Systems integration, not piecemeal approaches.	Promote cross-functional collaboration

Table 4.1 Group A Response Summary

4.3 GROUP B RESULTS - CHEMICAL, MANUFACTURING AND RELATED INDUSTRIES

This group includes companies that are primarily involved in manufacturing assembly operations or in chemical related process manufacturing.

Company B1 is a large European petro-chemical company which has since merged with a large British oil company. Company B2 is a large pharmaceutical corporation with global recognition. Company B3 specialises in operating distilleries. Company B4 is a well established UK chemicals firm. Company B5 specialises in designing and manufacturing luxury automobiles and jet engines. Company B6 also specialises in car manufacturing.

Company B1

Aim of BPR

The company's objective in undertaking BPR was to streamline and integrate disparate business units to help minimise redundancy in business operations.
In many ways the objective was to develop a corporate approach where previously there had been none.

Role of ISp before BPR

The interviewee stated that there used to be a distinct lack of policy and standard for purchasing IT hardware and software. Users would decide and purchase what they required and expect the internal IS team to support the resulting systems. This was perceived to be difficult, expensive and to often result in non-integrated systems. The role of ISp at this stage was to support the diverse needs of these systems and "make the best job of it".

Role of ISp during BPR

ISps were brought in from the beginning of the process simplification exercise to help identify areas where processes could be eliminated, standardised or at least simplified.

Technological skills were used together with an understanding of the business requirements to help devise simpler, common systems that supported the new process based activities. The ISps' role was as process design advisor and technical adviser.

Role of ISp after BPR

Progressively during and after the initial process reengineering initiative systems professionals became involved in creating an integrated environment where disparate business units were enabled to access and process information using centralised systems. Moreover, organisational standards and policies were developed and adopted in relation to purchasing and supporting of technology. The role of ISp, which began to emerge naturally as one of contributing to the process redesign became more explicit.

Anticipated future role of ISp

Increasing numbers of individuals require remote access to enable them to work in a more flexible manner. The future role of ISps within this company is expected to be to provide and support such a working environment. It is envisaged that ISps will have to work closely with the individuals to identify specific working patterns and formulate an appropriate working structure to meet the users' needs within the overall corporately defined process structure.

Company B2

Aim of BPR

There was a "business process simplification" approach to this company's BPR activity. There was strong emphasis on benefits capture and a clear a methodology for managing benefits:

- identify opportunities
- score boarding (up to expectations)
- realisation benefits.

Early results were expected. The benefits were expected to be seen in about a year after the initial start. The aim was to keep the IS redevelopment activities to a minimum in the change programme. As a result there were " only about 10 to 12 IS people involved in the project plus 3 people working with the usual IS area, the rest have been key members of mixed teams."

Role of ISp before BPR

The traditional role of ISps was explained by the interviewee to have been that of "a service provider assisting the business in strategically planning to use IS to achieve competitive advantage". IS was regarded as "service and solution provider". Its role was mainly seen as reactive with a small number of people recognised as proactive who sorted out priorities rather than get involved radical decision making.

The interviewer also commented that an individual ISP's understanding of the business was often limited to the sub-set of business activities that it s/he was responsible for at any given time.

Role of ISp during BPR

The role of those IS professionals who did get involved in reengineering was one of participation in teams that were dedicated to particular processes, for instance "providing support to R&D [research and development]". The first stage involved consultants, business staff and IS staff who undertook a first analysis of the situation and painted an initial vision of the desired business process.

The second stage consisted of a large team of consultants led by business managers and including but not led by IS staff. The role of the IS members of the team was two fold:

- First, as all team members, to act as change agents,
- Second provide process analysis/process design skills in identifying and defining requirements.

In this organisational construct the ISPs worked in a matrix environment and were accountable to project managers as well as departmental managers. It was stated that "there were hiccups in performance management and reward management that did not always go smoothly".

Role of ISp after BPR

Although the BPR exercise aimed to keep changes to the IS/IT infrastructure to a minimum, some crucial aspects of information processes did need to be changed with support from the IS department. In particular ISps needed to play an integration role initially using middleware to integrate and were necessary modify existing applications to support the simplified processes.

Following on from the process simplification activities "IT policy groups were formed and each function has its own steering committee to review its information strategy and plans". The chairmen of each committee form a 'super committee' including the head of IS. There is a cross-function of people on this committee not necessarily top/senior management. There is a definite move to seeing IS as a potential agent of process integration and further simplification.

Anticipated future role of ISp

During the past twelve months the IS function has developed a vision of how it might contribute to the further to business process improvement and cost reduction. As a result of the BPR experience more "hybrid" people are being sought who can influence the direction of future BPR activities.

Company B3

Aim of BPR

In this organisation BPR represented a second stage of organisational improvement, after a Total Quality Management (TQM) programme. The interviewee stated that "the company asked itself questions such as how can we do our business the way we would like?" The company also intended to improve the maintainability of its IT system.

Role of ISp before BPR

It was stated that the key role of ISps used to include back office automation and program writing, with little involvement in the higher levels of decision making. Technology had been seen mainly as a support tool to the status quo and not an enabling tool for change.

It was suggested that until recently IT has been telling the business what it needed and now the reverse was being attempted.

Role of ISp during BPR

The BPR project had been very much systems-driven, in that SAP was adopted as a system and the organisation had to be realigned to suit the system in order to achieve the desired performance improvement. As a result those aspects of the business that it was considered reasonable to change were changed and others were not. Even though the BPR exercise followed a review of the entire business process, including the supply chain it could be argued that the SAP system had, to a great degree, dictated the process redesign activities in this organisation. The ISps were members of the implementation team which adapted the organisation to the system.

Role of ISp after BPR

The interviewee suggested that the organisation now needed to "identify what other business processes it needed to think about". The IS function was adapting to these changes and there had to be a shift towards team base process definition and partnerships.

A steering committee had been formed with a two fold role:

- First, handling issues related to matching the systems to the business needs rather than vice versa
- Secondly, dealing with implementation issues and reviewing progress.

There had been a minor reduction of the IS staff headcount since the SAP implementation was completed. Most remaining staff had been able to "grasp the new system and there has been a skill set change". There has been a "good response" from the more junior/clerical staff who had been more flexible to change.

Anticipated future role of ISp

There are indications that both user and IS management are very much "more involved and willing to cultivate change". Implementing the SAP system was recognised as a "catalyst to change" and the beginning of ongoing attempts to further integrate business units and departments. ISps will have a key role to play in achieving this integration.

Company B4

Aim of BPR

The aim was to provide timely data to ensure improved performance as measured by business results. There have been four major areas of process improvements:

- how to win business customers?
- how to make products?
- how to supply?
- how to plan the business?

The company recognises that significant improvement "this involves an integration of the above points"

Role of ISp before BPR

In the past the role was very much functional divisions oriented. This reflected in the fact that each area of the business had its own ISps. There had been little functional integration. ISps were not expected to contribute to achieving and maintaining an overall business benefit.

Role of ISp during BPR

There had been several major changes. There had been a much "closer understanding of how company wide performance improvement (PI) is assured through key performance indicators (KPI)" and ISp are expected to contribute and, where possible, to enable this.

The project also led to "IS skills being used, such as project management skills" which could then be used in other areas of the business. Recognising what people with these skills could contribute was a valuable outcome, even though it was not the initial reason to ISps having been brought in. Other transportable skills included analytical skills, deployment of process flow charts, and "application of Lotus Notes which IS team are already skilled to use it".

Role of ISp after BPR

The IS group has been redefined the 'Information Management' team which establishes the potential uses of IT in the business, and the 'IT group', which deals with the computer networks, telecommunication and computing and hardware issues.

The IM team works with the IT team and shares a wide range of skills which has helped to increase multi-skilling. IT is used in every process and there are a series of process teams with one IM person in each team. IT's role is based on a 'one-to-one' basis to support the process teams.

The IM/IT professionals are now more proactive. There are three main areas under current review:

- communication infrastructure
- software development protocols
- technical specialist support.

Anticipated future role of ISp

The future role of ISp is seen as an increasingly involved and integrated into the business. This is mainly as a result of the BPR initiative that forced the different areas of the business to work closely together.

Company B5

Aim of BPR

The key aim of this organisation's BPR has been to improve responsiveness to the customer. The aim is to use IT to enable the company to provide unequalled after sales support. The company's mission statement includes ten key goals from which are derived the goals for each major function. Product quality and excellent customer service are seen as the company's key differentiating characteristics.

Role of ISp before BPR

Originally the focus of IS/IT was on accounting, gradually moving on to manufacturing support with the introduction of a planning and control system (MRP). In the past ISp was used to "speed up the processes and not to re-engineer the

process". Technology had been perceived as a support tool to help automate some business activities. Therefore, the role of ISp was limited to the application of technology to help speed up business operations and there was little scope for the ISp to contribute to redesigning of business activities.

Role of ISp during BPR

The role of IT within the BPR exercise was to help customers gain satisfaction through using reengineered logistic processes. "A customer was able to talk to the dealership about delivery or any other topic". Within the reengineered process IT is used to "record the information about the product, the price, manufacturing issues", also information about "follow up support. This information is linked with market research and is used for measuring customer satisfaction. The role of ISp has been to help design a system that would help empower the dealerships to further meet the customers' demands. It is no longer a back-room role.

Role of ISp after BPR

The interviewee explained that the BPR programme had been extended to include other customer and supplier related processes. ISps were continuing to focus on more integration, providing software where appropriate to support the extended logistics process. For instance, they were adding features that will allow the company to handle complex product enquiries, and provide a more sophisticated interface with engineering. This will be an investment, progressively looking at all the systems and processes that enhance the owners perception of the company and its product.

Anticipated future role of ISp

The future role would most likely still focus on customer care, but move information even nearer to the customer. It is envisaged that in the future, if the customer has a problem with a car, a set of symptoms will be entered into the system by the dealers and the system will produce diagnosis. This will require ISps to "extract knowledge and put it in everyone's head". Therefore there will be a need for "learning about the

car in terms of product engineer, logistics etc". To enable dealers to handle customer queries such as "the engine does not start, or the light does not work, piece of leather cracking, steaming windows", and other complaints, the ISps will have to become fully conversant with the company's products, services and processes.

The interviewee further explained that speeding the query handling is only one aim, however, the key purpose is to help dealers use the technology to increase productivity and generate new business. He states "in other words a way of not just quicker but smarter". Challenge for IT will not be to work harder but to work smarter. They would become "imaginers" or "knowledge engineers".

Company B6

Aim of BPR

BPR as used by this organisation was "a strategy to help it become more efficient". BPR was regarded as a mechanism to achieve change and improvement in performance. The approach for "extracting waste" was heavily based on process mapping and the use of flowcharts.

Role of ISp before BPR

In the past the role of IS had been very much geared to supporting low level manufacturing automation initiatives.

Role of ISp during BPR

The main focus during BPR had been on simplification rather than automation. In particular the IM director had preached a message of "through away big computers and use networked PC to help make processes simpler". The interviewee believed that the organisation had needed to "find out what caused the complexity in manufacturing and try to avoid it". There had been a clear need for process management, not the traditional approach.

The IT communications infrastructure was not changed. The "motorway is still there with the same rules, but the cars have changed". For example, "is it now possible to drop an application on any server". The interviewee also believed that the BPR work had revealed the need for a robust data architecture and not just a technical infrastructure, "for example, as user requirements change data structures should not need to be changed only but the data itself".

Role of ISp after BPR

The role of ISp post BPR was said to be one of continuing to work with the business and help mechanising mundane jobs, but also to provide a network and systems architecture that recognised that needs would change..

Anticipated future role of ISp

The interviewee stated that "computer architecture for the first wave is already passed, gone." In future the role of ISp "is seen to be locked into the business processes". Process simplification will still be important, and the avoidance of implementing unnecessary process steps or technologies.

The following table represents a summary of the key points from the follow-up interviews with the participating organisations in Group B:

	Company One (B1)	Company Two (B2)	Company Three (B3)	Company Four (B4)	Company Five (B5)	Company Six (B6)
Nature of business	Petro-chemicals	Pharmaceutical	Distillers	Chemicals (ICI)	Automotive	Automotive
Aim of BPR	To streamline and integrate disparate business units.	Business process simplification.	Performance improvement. Organisation improvement.	To provide timely data for performance improvement.	Improve customer responsiveness. Use of IT for sales support.	To become more efficient.
Role of ISp *before* BPR	Support distinct systems.	Service provider assisting the business to use IS to achieve competitive advantage.	Back office support – reactive. Telling business what is needed.	Functional division oriented.	Responsible for operational systems. "Speeding up processes, not reengineering the process."	Low key production automation.
Role of ISp *during* BPR	Assist with process simplification.	IS function seen as catalytic change agents. Able to deal with issues from a wider viewpoint.	Helps to shape what the business wants. Changes in training and incentives.	Process integration. IS skills include project mgt., analytical, IM, use of IT.	Customer satisfaction through reengineered logistic processes and access to information.	Help simplify processes. IS people technically aware, business people not.
Role of ISp *after* BPR	Creating integrated environment for different BUs. Set up organisational standards and procedures.	Some crucial process work undertaken, plus integration. IT policy groups set up, creating vision of how IT can contribute.	Team-based partnership, to supply what the business needs. Steering committee set up. No longer telling business what is needed - reversed.	Responsible for info. mgt. - proactive. Exploiting technology. IS mbrs spread through other teams.	Integration of project – process support.	Continue to work with the business, and help to mechanise mundane jobs.
Anticipated *future* role of ISp	Support for remote access to key business processes.	Review of how IT can add value. Must understand business - hybrids sought. Help add value to business.	Business leading change – IS supporting. Catalyst for change and integration.	Increasingly involved and integrated into the business.	Help to provide dealers with knowledge. IS to work smarter not harder – focus on business objectives.	Future of ISp is locked into processes.

Table 4.2 Group B Response Summary

4.4 GROUP C RESULTS - BANKING AND FINANCE

The following four companies represent the banking and finance sector. Company C1 is the UK national subsidiary of an international banking and insurance company. Company C2 is an insurance brokering company, also providing banking and credit finance services. Company C3 is an independent financial advisory company. Company C4 is one of the largest domestic mortgage and banking service providers in the UK.

Company C1

Aim of BPR

The aim had been to improve and streamline processes. It had been decided that change was needed in order to succeed in an increasingly competitive market. The information systems had been perceived as a critical business resource. The management levels wanted to be able to communicate success stories and boost morale.

Role of ISp before BPR

It was stated that prior to the BPR work "applications that looked good in the market place were selected" with little direction sought from the ISp to help identify an appropriate application that would be compatible with the organisation's IS strategy.

This organisation had an Information Systems Division (ISD) of 31 people. ISD was located in a different geographical location from many users, who were looked upon as "the accounts manager who looks after the system". Different business units had independent systems – "horses for courses". This particular BPR initiative focused specifically on one of these units.

Role of ISp during BPR

Consultants were used during the BPR exercise to supplement on roll staff. The focus was on process redefinition. Wherever possible the existing systems were migrated to simpler ones. This had involved document flow analysis and revision and substantial amounts of user retraining.

Role of ISp after BPR

The role of ISps was thought to have become clearer as shown by the fact that "there is now an IS steering committee which is a sub committee of the general manager's group".

The business needs are still defined before the IS is brought in. At present the internal IS staff resource is 12 ISps, and there are now consultants. It is acknowledged that the trend in technology as well as the business environment is always changing. The interviewee argued that "there is still a long list of requirements to change and improve the system in order to improve the productivity". Progress was said to depend on budgeting and ISD resources. The interviewee suggested that in order to continue with BPR they needed a bigger team.

Anticipated future role of ISp

The role would be to "Help the business change". The aim was for ISp "to be given projects to meet strategy and improving claim services to customers" as well as brainstorming with the people close to the customer. It was envisaged that there would be a need to "provide a structure, helping the rest of the business to put ideas in place". This would involve facilitating a working party of different representatives to bring variety to the meeting, and "being more objective than people on the front line".

The future for the business was to concentrate on "renewal and retention of existing customers rather than attracting new customers". This would be accomplished by providing appropriate incentives and being proactive towards customers. This was

particularly important in the area of claims, where improved productivity was measured by the number of policies processed per member of staff. A recent internal questionnaire suggests that there had been an improvement in the decision making linked to process improvements and improved information.

The formation of steering committees was also regarded as suggesting an increasing recognition of the role of ISps in successful business transformation. The interviewee also commented that "as organisations rely more on streamlining their businesses through process orientation, technology plays a key role in integrating the activities within and across processes. Hence, a more formal structure of ISp roles is emerging to help add value to business goals by bridging them to technology".

Company C2

Aim of BPR

A change programme had commenced by looking into similar but separate activities in different parts of the group. This was in order to identify the core activities i.e. banking, building society, alliances, estate agents etc.. A consultancy team had carried out a CBA (cost benefit analysis) of computerisation. The result was that there was a perceived need for further computerisation of the core processes. In particular it was felt that the business had to review the time it took to carry out the key tasks and consider the issues related to team working. However, it was stated that a "lack of commitment brought the project to a halt".

Shortly afterwards a "customer care vision" was promoted as the main driver behind the change programme. This involved communicating the importance of customer satisfaction to the staff with the aim to increase customer focus in relation to both internal and external customers. There was also an emphasis on establishing how other organisations used technology to support their business needs, as one of the perceived causes of the earlier failure had been a " limited link and appreciation between IS and the business professionals". Simpler, more team based working

practices were the expected BPR outcomes. A quantum leap in performance was required.

Role of ISp before BPR

The interviewee noted that "IS was outside (the core activities) and needed to change". Therefore, the company decided to "change the way IS group is working with the help of the BPR work". The technical IS team had been very much product focused rather than process or user focused and the technical professionals were dictating the needs of the business rather than visa versa". Therefore, the business functions had had little input on task activity improvement projects. IS had been very much part of the problem rather than part of the solution.

Role of ISp during BPR

An external consulting team was brought in to help plan and implement the change initiative. One of the main aims was to minimise the contact between ISp and the users. "The IS's role was to deliver the system to the consultants and not the users' in order to eliminate the risk of going back to the original and to insulate against pressure to change the aim of BPR".

The interviewee stated that the success of the BPR initiative in this company had due to the fact that "the project was 110% business-led and now people appreciate the advantages of this decision. IS had no control of the project. The programme involved 25 individual projects".

He also reflected that "in hindsight the project had benefited from the IS activities to be outsource/facility management rather than subcontracting the IS aspects of the project to [the company's] IS team". In this situation the IS director became the supplier to the consultant, similarly the user department head was also the head of the strategic group and therefore boss of the consulting team. Increased communication and education would also, in hindsight, have helped process people and IS people

working together. The interviewee disclosed that "BPR started as hush hush" due to the perception that there was a "resistance to the introduction of change".

It is further suggested that "the chief executives needed to be involved more rather than a level down". The interviewee reflects that "from the IS side, would have chosen a different platform, i.e. from an IBM mainframe to a client server and open system environment". This is believed to help allow for increased flexibility in system management and control.

Role of ISp after BPR

The key role identified after the BPR was that of ongoing process owner. This involved transferring process ownership from external consultants to the "internal people". There had been an effort to "move the ownership of processes from IS to the business", but ISps had been expected to become "part of a process team".

The interviewee further emphasised that the aim had been a "marriage of the IS and business people, which has not been easy". It was stated that difficulties were particularly evident in defining the business analysis role of IS within the team. Also, it had been intended to "move the IS people away from finding technical solutions to supporting business activities".

The term 'partnership' was used to define the current link between the ISp and the business professionals. The interviewee seemed pleased to state that "there is no longer the excuse made by business professional that ISps have missed the deadline and not delivered on time".

It was recognised that "as the business and market place change there has been a need for the business to adapt its internal partnerships and relationships". Thus operating as a team and "finding a pragmatic way of accommodating for business needs and not just the technical requirements" and leaving the business to "focus on what drives the business imperatives". A Business Projects Division had been formed to look after and control future projects. The activities this division included training, working

design, IS development, and process ownership determination. Furthermore, the division was concerned with prioritising projects according to costs and benefits, and relationship management including arranging secondments. The role was not a link role but a driving role.

Anticipated future role of ISp

In the future there is a need to build a "bridge between IS and users to minimise influence of technology as in the past". The interviewee believed that "partnership of equals promoting change and developing skills" was the way forward. The company was "aiming to enter the direct insurance business using communication technology". This implied the need for "change initiatives to come forward from business project teams concentrating on skills needed for job enrichment". The future was seen as "IS building long term relationships with the business" and above all else "increased communication".

Company C3

Aim of BPR

BPR was undertaken by this organisation a result of increased market pressure, with the group's seven autonomous businesses all experiencing different market pressures at the same time. There was also the threat of new entrants to market which were willing to cut their prices to gain customers. Furthermore, there has been a changing attitude to financial services by, for instance, car manufacturers who were setting up their own financing subsidiaries.

There was also a belief that the organisation needed to grow substantially and also reduce overheads. Overall it was perceived by this company that a radical change was needed and that "a quantum leap was then required to keep up with the competition". Hence, the focus of BPR had been on business growth and becoming more customer focused. The company developed a strategy that concentrated on large dealer groups, taking 18 companies on board by following acquisition/growth scenarios.

Role of ISp before BPR

The interviewee believed that in the past "users did not know what they want to achieve therefore, they were not getting what they wanted". Also, "that users were not educated in technology's potential". As a result "IT people showed solutions based on the systems they had, hence the systems were not customer focused nor user friendly. A complex system was designed, and therefore, a complex training package had to be put in place taking a great deal of time and producing hidden costs".

The role of ISp was reactive to problems rather than proactive in problem prevention, and did not provide guidance or consultancy other than in terms of technical solutions.

Role of ISp during BPR

The BPR exercise reviewed all existing customer support processes. Dedicated sales teams emerged as the chosen process solution and on-line call centres were developed for quick customer response even at weekends. As a result of adopting this radically new approach the ISps were increasingly responsible for integrating the relevant processes to help respond to customer requirements. Although they did not lead the reengineering or define the solution they had a key role to play in enabling a new way of doing business.

Role of ISp after BPR

Competitors had soon followed suit in introducing dedicated teams and a call centre approach. It therefore became apparent that there was an ongoing need to stay ahead with the application of IT and to identify areas, such as customer relations where IT can be deployed to contribute. The basic team approach developed during the BPR initiative had therefore been retained, with IS working with users to identify process improvement opportunities.

Anticipated future role of ISp

In this organisation IT is now to be used as a competitive tool. For example, the "potential use of the Internet as a part of advanced showroom technology is being considered" and potentially used as a 'mechanism' to deliver market advantage. Given this recognition of the strategic importance of IT and BPR a new way of managing change initiatives had recently been introduced and was seen as defining future roles and responsibilities.

Organisationally there is a main board of directors which sponsors major initiatives. The board includes the IT director, Finance Director etc.. There is also a number of divisional steering groups which have memberships of the functional directors, systems development manager (no. 2 in IT set up), divisional project co-ordinators and project team leaders. Sometimes consultants are used on a temporary basis, but they must transfer their skills to in-house staff within two to three years.

The vision and anticipated outcomes of all major projects are communicated to all staff, i.e. by giving presentations. Also "progress is reported every month and there is a fortnightly bulletin which encourages ideas and debate to drive the projects forward". The staff can feedback any concerns and there is also a person responsible as a facilitator to help with the implementation process.

The interviewer believed that it was mainly the IT management group who had felt threatened by this very open way of working, but that this did not apply to all the IT staff. " The management regards this as a threat since this may take away their responsibility and control, and that this combined with workflow management based on distributed systems was all resulting in a shift of ownership to the users".

Company C4

Aim of BPR

The purpose of BPR in this organisation had been two fold:

- Firstly, at the departmental level it was recognised that the existing processes were not ideal and the organisation needed to consider the improved ways of doing things. Therefore, an overview of the day to day work processes had been conducted;
- Secondly, at a corporate level a long term strategic vision had been developed, concentrating on customer relationships, and this too had highlighted the need for new ways of working.

Role of ISp before BPR

In the past the IS team had been mainly involved at the operational systems development and support level, with some occasional ISp input to the top level thinking. It was suggested that "the key focus of the ISp used to be mainly on operational level technology with very little involvement in the organisation's strategic decision making".

Role of ISp during BPR

As part of a forward-looking strategy development exercise the "systems analysts became part of core processes and heavily involved in providing the solution and supporting post implementation activities". The interviewee explained that there had been some "external consultant involvement at the initial stages" of the programme followed by greater involvement of the internal people. The possibility of outsourcing IS support to the BPR had not been ruled out, but a combined in-house and consultant approach had been taken. "The main role of the IT team was to identify ways in which processes might be changed and how the systems might be joined but treated as separate entities". Although the organisation had aimed for an integrated system individual business unit autonomy in using and maintaining the system was desired.

Role of ISp after BPR

As a result experience gained in the successful BPR projects, ISps are now seconded to projects and, since the business process user is also involved, both sides carry the cost of the projects. In some cases, however, the IS function is recognised as a cost centre in itself. This applies primarily to legacy systems which are progressively being replaced. The key issue is that the ISps share the responsibility of systems solutions provision with the business professionals to ensure the targeted aims and objectives are achieved.

Anticipated future role of ISp

In the future a joint business and IS steering group is to be formed to position IS closer to the business. At present a minority of staff understand the culture and the short-term objectives. As a result, it is recognised that there will continue to be a need for investment in post-implementation education and training.

There was an expectation that the ISp role would be much stronger as part of "the process development team in undertaking the redesign and the documenting the output". Also, ISps would play a key role in " process design, standardisation, communication and education" as well as "the application of appropriate technology and methodology". Incremental business improvement is to be expected rather than radical change.

The following table illustrates a summary of the key points from the follow-up interviews with the participating organisations in the Banking and Finance sector:

	Company One (C1)	Company Two (C2)	Company Three (C3)	Company Four (C4)
Nature of business	Financial Services	Financial services	Financial Services	Financial services
Aim of BPR	Aim to improve and streamline existing processes.	Customer care vision set up as main driver. Quantum leap required.	Market pressures, resulting in growth objective and customer focus.	Improve work process to concentrate on customer approach.
Role of ISp *before* BPR	IT applications led business. Short-term technology focus.	IS "outside" the business and product based - dictating what the business could do. IS needing a change.	Automating existing work practices. Users not getting what they wanted.	Operational systems development, with some involvement at top level.
Role of ISp *during* BPR	Work more closely with users. Process focus.	Minimise contact between IS and users. Deliver systems to consultants – not users - to eliminate IS "pressure" on users.	Used IT to enable on-line call centre.	Part of core processes to provide linked solutions.
Role of ISp *after* BPR	Help improve the system to increase productivity. Role formalised with setting up of IS steering committee.	"Marriage of IS and business people". Support business activities in partnership, rather than just finding technical solutions. (Leaving business to focus on business imperatives.)	Became apparent how IT can be used for competitive advantage. Use of IT for CRM.	Seconded to projects; IT and business sharing the costs or IT set up as cost centre.
Anticipated *future* role of ISp	Continue to help business to change, and provide a structure to help the rest of the business put ideas in place. Customer focus.	Building long term relationships with business. Increased communication.	Use technology to provide "mechanism" to deliver market advantages.	Steering group set up to join business and IS. IS to be nearer business. IS role much stronger as part of process development team.

Table 4.3 Group C Response Summary

4.5 GROUP D RESULTS - IT SECTOR

The following four companies are representatives of various elements of the IT sector. Companies D1 and D3 are global blue chip companies involved in hardware manufacturing, software development and consultancy services. Company D2 is an IT services company, and company D4 is a manufacturer of computer specialist hardware and provides related IT services.

Company D1

Aim of BPR

For this organisation business reengineering had involved two main stages:

- "start to sort out the IT department"
- "decide what the company needs to be?"

The perceived issues were not always related to IT problems.

The main drivers of process reengineering had been issues relating to people, culture and process management. Essentially, it was felt that the use of IT was not aligned with the business needs.

Also, the BPR initiative had been aimed at producing a "reduction in processes elapse time, since a drop in processes time will result in improved customer satisfaction".

Role of ISp before BPR

In the past the role of people in the IT area had been focused on system's support. The old IS group were technical consultants and as such they did not know how to implement process reengineering for example. The ISps had focused on the development and maintenance of the required technology. There was little evidence of them becoming involved in business issues where IT might have added greater value through the identification of a business oriented systems solution.

Role of ISp during BPR

The role of ISps had been to help with streamlining processes. The ISps in the actual reengineering initiative had played an active role in the both day-to-day and strategic aspects of the BPR. IS had been seen as the "catalyst for BPR". It was also suggested by the interviewee that during the BPR conscious efforts to align the business and IT activities in order to help streamline the organisational activities.

Role of ISp after BPR

By the end of the BPR exercise the "IS business unit was transformed". The principal roles of the IS division included formulating policy and strategy for IS on international scale, as well as supporting the current business activities by providing IS consultancy.

An IS steering committee had been established, which consists of "five people, four from the IS team and a business director". "Strategies are set at the headquarters but it is up to the business unit heads to decide how to apply the strategy. The role of ISps has become increasingly focused on the business, taking mainly a corporate view. This has helped divisional integration". The organisation "had experienced the integrating role that ISp can play in achieving widespread business benefits". Whereas in the past the role of IT had been supporting functions, now it was supporting the business.

The head of the IS team was now responsible for IS policy strategy and functional strategy, determining the right skills from IT and addressing the corporate IT infrastructure issues. There was now a central architecture definition based on client/server technology. Some technical activities such as:

- "Network service management,
- Manage services to the desk worldwide, and
- Single telecommunication management"

were also performed centrally.

Anticipated future role of ISp

There was increasing recognition of the ability of ISp to add value to the business. As the organisation had had ISps involved at the early stages of BPR, there had emerged a greater understanding of the part that ISps could play in the successful BPR. Therefore, the interviewee envisaged that "the role of ISp will be to continue to further add value to the business transformation activities of the organisation".

Company D2

Aim of BPR

The process reengineering initiative in this company was referred to as a "change programme" but it had focused heavily upon the use of IT within the organisation. The interviewee believed that more and more businesses are about processing of information, and "as a result the role of IT has become increasingly important". The investigation had involved determining how IS supported the existing business and to what extent if any does it supported the needs of the business in the future.

An issue of concern had been the 'translation gap' between IT and business. One of the main aims of the company had been to close the gap in translating issues.

Also, it was decided that the "business needed to be realigned around its processes and a restructure of functions was required".

Role of ISp before BPR

Traditionally ISps had worked at an operational level where the focus was limited to the day-to-day technology issues with little reflection on the wider organisational perspective.

Role of ISp during BPR

The enabling role of IT was recognised within the BPR activity: "their focus was on streamlining workflows and the capture the benefits that could be achieved through the application of technology". The interviewee further explained that "IT was used to reorganise the business which has led to fundamental changes". IT's role had been reassessed and had become more of a "business support role". An important aspect of this had been the ability to talk to people and communicate what ISps could offer. The interviewee stated that during BPR he believed that the "technology and interpersonal skills had to come together".

The interviewee stressed that conscious efforts were made, as part of the reengineering programme, to incorporate technology activities in the wider organisational transformation activities. The BPR investigation had also determined the ISp skills and structure "correct for the future". The interviewee believed that with information systems and technology ("Is&t) in the past the 't' had dictated to 's' and 's' dictated to 'I'. However, he believed that now as a result of the BPR experience the 'I'is were dictating to 's' and 's' to 't'".

Role of ISp after BPR

Due to the recognition of the increasingly important role of IT, IT issues post-BPR were handled at the board level. "This forces a business view on IT". IT related activities were now very much in line with the business. Business professionals had become more IT literate and IT professionals had had to become more business literate. There was now a hybrid approach where "business consultants are required to have a hybrid skill of both business and technology".

The interviewee believed that "living in an information age appropriate application of technology is vital to information manipulation". The gap between technology and business was closing and technology has had to become increasingly business and internal customer focused. The organisation was continuing its efforts to integrate the

previously technology focused ISps with the business activities to help achieve a common business goal.

Anticipated future role of ISp

The company had created "change teams" to maintain the change impetus and manage the impact of change. ISps were seen as key members of these teams. The future seemed to indicate that "the IT departments have reengineered themselves or are in the process of it, or plan to do so in the future".
The view of this interviewee was that "ISps will increasingly become involved in helping to integrate the organisational activities and therefore helping to enable the overall process reengineering programmes" and that "the changes in technology is bringing this closer".

Company D3

Aim of BPR

This large global corporation had used a BPR approach to "refocus the business areas for performance improvements and to help respond to a fast growing competitive market pressures".

This US company had initiated its BPR initiatives in the US where "all business activities were taken back to square one"

"Another concern was for the European divisions to become closer and to be able to exchange information". This was to ensure that there is clear perspective within Europe and a suitable reporting mechanism for the top management. In order to achieve this level of communication and exchange of information "appropriate applications needed to be developed". In the past there was little integration between the divisions within the UK and across Europe.

Role of ISp before BPR

The role of ISps before BPR had been one of supporting disparate systems where islands of technology had been created in different part of the business. Development and maintenance of these systems had been the key focus of the ISp in this business environment.

Role of ISp during BPR

ISps had played a pivotal role in the BPR exercise. One of the main results of the BPR changes had been "the centralisation of the data processing and bringing the business units together with the aid of a central server". The integration of business units had been only achieved through systems centralisation. Therefore, the key role of the ISps had been to contribute to an organisational-wide systems integration.

Role of ISp after BPR

Following the initial BPR activity focus had shifted to the back office. The interviewee indicated that there were many and varying dimension to the role of ISp within such a large organisation. ISp were now expected to be involved in both the operational, technology oriented issues and the strategic, business oriented ones.

Anticipated future role of ISp

"Manage the changing IT infrastructure at different levels of communication" for example, upgrade LAN or Client/Server architecture "to support ever greater demand for better communication".

Company D4

Aim of BPR

Most of the company's customers were in the public sector and subject to "market testing". "Their needs have changed to take into account new legislation". In the past the company had been involved in selling of hardware and software and associated after sales support. However, the focus of the company now was on systems integration "taking a customer specification and designing to it". Also, the company was now more involved in the training of staff to use the new system. They had begun to challenge the processes that clients used. "For instance if the system was being implemented for cost saving purposes such as headcount reduction then a simpler IT solution might be required for the business".

The interviewee explained that in adopting a new approach to its customers the company had recognised that "an impact gap existed in terms of getting most out of IT". "The philosophy has been to move from a task automation i.e. employing IT to reduce cost, to process automation i.e. using IT as part of the business infrastructure, and finally to what we referred to as a "fifth utility" or "window on the world". This last step was seen as a true business integration where IT was used for competitive advantage".

Role of ISp before BPR

The interviewee's comments indicated that traditionally the ISps had been supporting individual divisions. This was perceived as having limited their independence and consequently their impact. It was believed that there needed to be more co-ordination between the divisions in order to minimise 'overlap'. "There is an overlap within the business divisions for example, between the PC and midrange divisions". But prior to BPR it had been difficult to address this.

Role of ISp during BPR

Since the BPR projects had been underway "there was a switch to divisions aligned to by vertical market i.e. revenue streams". Within the divisions one area is concerned with sales and marketing to sell "value added services". Another focuses on technical support, but "the 'techies'" under go customer related training schemes as well as gaining skills in new technology. The organisation still perceived the role of ISp to be technology oriented, but during BPR efforts were made to re-educate the technology professionals to become more business and ultimately customer oriented.

Role of ISp after BPR

Recently "the role has become increasingly focused on customers needs". The interviewee confirmed that "committees are cross-divisional examining what is best for the company" and this approach had resulted in continuing decentralisation, with "divisions becoming partners rather than one entity". This had meant that the company perceived its "various businesses as partners, perhaps as subcontractors, rather than competing against them". "This way the total revenue is maintained as the extra services are usually bought from own divisions" through as an "arm's length trading" approach. This culture shift in the work environment had resulted in the ISps becoming "an integral part of a divisional integration programme aimed at establishing a common company value set".

Anticipated future role of ISp

As "the legacy system has been outsourced" it was perceived that the internal ISps would have more emphasis on "strategic decision making". This meant that it was likely that the role of ISp would become increasingly detached from operational technology oriented issues to assume a more strategic, organisation-wide perspective where ISps would be regarded as contributors to helping achieve the long-term organisational goals.

The following table is a summary of the key points from the follow-up interviews with the participating organisations from the IT sector:

	Company One (D1)	Company Two (D2)	Company Three (D3)	Company Four (D4)
Nature of business	Global blue chip	Services	Global blue chip	Blue chip
Aim of BPR	Realign IT with business, as IS seen as catalyst for BPR. Hoped that process improvements will lead to increased cust. satisfaction.	Role of IT increasingly important. Realigning business processes and restructuring functions.	Refocus of business areas for performance improvements to respond to fast growing market pressures.	Aim to maximise IT benefits and use IT as part of business infrastructure for business integration and competitive advantage.
Role of ISp *before* BPR	System support to functions.	Translation gap between IT & business. Technology focused.	Little integration. Supporting disparate systems.	Work with business divisions in isolation, hence overlaps.
Role of ISp *during* BPR	Help with streamlining processes.	Help reorganise the business. More of a business focused role.	Centralisation, and integration of business units through systems centralisation.	More customer facing. Work with divisions to become partners.
Role of ISp *after* BPR	Supporting the rapidly changing business. Providing a corporate view of IS policy and strategy.	Business professionals => more IT literate, IT professionals => more business literate. Gap between IT & business closing.	Use IT to improve back office processes. Contribute at both technical, operational level and at strategic business level.	Integral to business integration and establishing common value set.
Anticipated *future* role of ISp	Increasing recognition of ability of IS to add value to the business.	IT depts being reengineered. IT helping to speed up reengineering initiatives.	Change IT infrastructure to support ever greater needs for communication.	More business oriented and less involved with operational activities. More emphasis on strategic decision making.

Table 4.4 Group D Response Summary

4.6 FOLLOW-UP INTERVIEWS OVERALL RESPONSE SUMMARY

As described within Chapter 2 (Methodology), follow-up interviews were undertaken with at least four organisations in each of four industry sectors. The primary purpose was not to be able to make inter-sector comparisons, but rather to simply to ensure a good cross-section of responses from a number of different industries.

By being semi-structured in nature, the interviews helped establish an understanding the respondent organisation's aims for their BPR programme, and then went on to investigate the role that ISps played prior to BPR, during BPR and then subsequent to the BPR initiative being completed. Finally, the expected future role of the ISp was discussed.

Each of these matters can now be reviewed on a cross-sectoral basis by combining under each topic the responses from the twenty responding organisations.

4.6.1 Aim of BPR

A1 – Improved information management and integration of customer services.
A2 – Integration of business units.
A3 – Drive profit by reducing cost.
A4 – Streamline processes. Reduce hierarchy.
A5 – Organisation change for more productivity.
A6 – Improved purchasing process.
B1 – To streamline and integrate disparate business units.
B2 – Business process simplification.
B3 – Performance improvement. Organisation improvement.
B4 – To provide timely data for performance improvement.
B5 – Improve customer responsiveness. Use IT for sales support.
B6 – To become more efficient.
C1 – Aim to improve and streamline existing processes.
C2 – Customer care vision set up as main driver. Quantum leap required.
C3 – Market pressures, resulting in growth objective and customer focus.
C4 – Improve work process to concentrate on customer approach.
D1 – Realign IT with business. IT as catalyst for BPR. Process improvements for increased customer satisfaction.
D2 – IT increasingly important. Realign business processes and restructure functions.
D3 – Refocus business areas for performance improvement to fast growing market pressures.
D4 – Maximise IT benefits using IT in business infrastructure for integration and competitive advantage.

As expected there are some similarities in the aims of the organisations being interviewed, but there are also differences based on the market pressures.

Organisational integration and process streamlining are some of the key aims for the organisations in Group A (Distribution, retail and services), reflecting perhaps the substantial cost bases required to operate in these sectors.

Similarly, in the Group B (Chemicals and manufacturing) organisations cost reduction and process improvements were key, and the main aims of the BPR programmes were in the areas of organisational performance gains and process improvements.

In the increasingly competitive Group C (Banking and Finance sector), where customer retention is paramount, customer care was the main driving force, and the aims of the BPR projects in this sector were strongly front office focused.

Perhaps not totally surprisingly, the BPR projects undertaken by organisations in Group D (IT) were particularly focused on the use of information technology, and how an organisation might gain the greatest benefits from their IT investments.

However, an important observation is that despite the differences in the various industries and the consequent differences in the aims that various organisations had for their BPR initiatives, process reengineering was confirmed as the mechanism by which these improvements were being searched for, and respondents were happy to elaborate on the role of Information Specialists within the initiatives.

4.6.2 Role of ISp Before BPR

A1 – Responsible for disparate back-office systems.
A2 – Office automation.
A3 – Automation of operational level tasks.
A4 – Support the existing hierarchy.
A5 – Responsible for office automation and information on properties.
A6 – Technology support.
B1- support distinct systems.
B2 – Service provider assisting the business to use IS to achieve competitive advantage.
B3 – Back-office support. Reactive. Telling the business what is needed.
B4 – Functional division oriented.
B5 – Responsible for operational systems. Speeding up processes not reengineering processes.
B6 – Low key production automation.
C1 – IT applications led the business. Short term technology focus.
C2 - IS "outside" the business and product based, dictating what the business could do.
C3 – Automating existing work practices. Users not getting what they wanted.

C4 – Operational systems development with some involvement at top level.
D1 – Systems support to functions.
D2 – Translation gap between IT and business. Technology focused.
D3 – Little integration. Supporting disparate systems.
D4 – Work with business divisions in isolation, hence overlaps.

The consistent message across all of the industry sectors was that traditionally the main role of the ISps had been to manage and support back-office systems, which were often disparate and functionally divided. The ISps in all groups were described as being technology focused. In some cases there was also evidence of ISps using this technical knowledge to dictate to the business functions what they could do, rather than the business specifying requirements to the ISps. In other cases ISps were entirely reactive. In general there was a clear distinction between "IS" and "the business functions" and IS was seen as "outside" the mainstream business.

It interesting to note that one company had used external service providers to assist in forcing change upon its own ISps and demonstrating using IT for competitive advantage, and that occasionally other responses indicated that companies were beginning to perceive some of the change issues that ISps could support them with. In the main however, regardless of industry, before BPR the organisations in the interview sample were using their ISps as support for automated back-office functions or, as one respondent put it, "speeding up processes rather than reengineering them".

4.6.3 Role of ISp During BPR

A1 – Functional integration to enable more flexibility and customer focus.
A2 – Help with process mapping. Increasingly involved in change programme, creating a hybrid environment.
A3 – Identify opportunities and weaknesses. Technical review panels.
A4 – Supports achievement and maintenance of change. Integration projects.
A5 – Business system prototyping.
A6 – Problem analysis and user support including training aspects.
B1 – Assist with process simplification.
B2 - IS function seen as catalytic change agents. Able to deal with issues from a wider viewpoint.
B3 – Help shape what the business wants. Changes in training and incentives.
B4 – Process integration. IS skills include project management, analytical, IM, use of IT.
B5 – Customer satisfaction through reengineered logistics processes and access to information.
B6 – Help simplify processes. IS people technically aware, business people not.
C1 – Work more closely with users. Process focus.
C2 – Minimise contact between IS and users. Deliver systems to consultants – not users, to eliminate IS "pressure" on users.
C3 – Used IT to enable on-line call centre.
C4 – Part of core process to provide linked solutions.
D1 – Help with streamlining processes.
D2 – Help organise the business. More of a business focused role.
D3 – Centralisation, and integration of business units through systems centralisation.
D4 – More customer facing. Work with divisions to become partners.

When discussing the role of the ISp during BPR, the message repeated again and again by organisations across all sectors was that during BPR the ISps became much more involved in working with the business units, creating a "hybrid environment". ISps worked closely with the business, and their technical understanding was used to help integrate previously disparate business units and create new integrated processes or redesign and streamline existing processes.

From the responses from all sectors a picture emerged of the process focused, integrating role that the ISps were generally expected to play in BPR projects. There were, however, some relatively minor differences of emphasis between sectors.

In Group A companies emphasised the role of the ISp as one of being much more involved with the business, supporting the process redesign phase, and supporting the whole change programme. These organisations particularly valued the contribution

and skills of the ISps in identifying areas for improvement and providing technical advice and knowledge (referred as a 'hybrid environment' approach by one interviewee).

ISps in the Group B organisations were very much involved with process redesigns during the BPR programme, helping to enhance and integrate processes and shape what the business wanted. The IS function was seen as having a different perspective, which could enhance the redesign of processes, and bridge the gap in knowledge of IT of the business people. Also, critically, IS was seen as the main catalyst and change agent by one organisation.

Banking and finance sector organisations also indicated that during BPR the ISp worked more closely with the business, using technology to enable new processes. However, although most worked more closely with the end users, in one case the technologists were kept away from the end users in an attempt to ensure the business decided what the new processes and ways of working should be and were not be influenced by the opinions or possible prejudices of the ISps.

The role of the ISp during the BPR initiatives within organisations in the IT industry sector included a move to working together with the business, the integration of previously disparate systems and helping to organise the business differently using technology to streamline processes. There was a slightly more technological emphasis to the responses from this sector, as is probably to be expected.

As with the role of ISps before BPR, and despite the different aims of BPR across the respondent companies, the comments on the role of these staff during the BPR exercise was remarkably consistent. Given that none of the interviewees had access to other interviewees comments, the degree of similarity and indeed interchangeability of the comments is remarkable.

4.6.4 Role of ISp After of BPR

A1 – Ensure information available across the spectrum. IT now involved in Strategic Programme.
A2 – Organisation-wide support and consultancy.
A3 – In charge of architectural changes, but with flexibility. (Not been successful in past. Duplication.) Business and IT divide being reviewed.
A4 – Technology is facilitator, but BPR is about organisations (IT is 2nd.). Small IT groups set up in each division. Disparate style to focus support of the business rather than the hierarchy.
A5 – User-driven. Focus on adding value to business and empowering users.
A6 – Overall handling of strategy in technology.
B1 – Creating integrated environment for different BUs. Set up organisational standards and procedures.
B2 – Some crucial process work undertaken. IT policy groups set up , creating vision of how IT can contribute.
B3 – Team based partnership to supply what the business needs. Steering committee set up. No longer telling business what it needs – reversed.
B4 – Responsible for info. management – proactive. Exploiting technology. IS mbrs spread through other teams.
B5 – Integration of project – process support.
B6 – Continue to work with the business, and help to mechanise mundane jobs.
C1 – Help improve the system to increase productivity. Role formalised with setting up of IS steering committee.
C2 – "Marriage of IS and business people". Support business activities in partnership, rather than just finding technical solutions. (Leaving business to focus on business imperatives).
C3 Became apparent how IT can be used for competitive advantage. Use of IT for CRM (Customer Relationship Management).
C4 – Seconded to projects; IT and business sharing the costs or IT set up as cost centre.
D1 – Supporting the rapidly changing business. Providing a corporate view of policy and strategy.
D2 – Business professionals=> more IT literate, IT professionals=> more business literate. Gap between IT & business closing.
D3 – Use IT to improve back office processes. Contribute at both technical, operational level and at strategic business level.
D4 – Integral to business integration and establishing common value sets.

This item for discussion was intended to establish if any lessons had been learnt from the enhanced role of the ISp already seen during the BPR programme. The aim was to determine if any of the changes in the role of the ISp that were necessary during BPR had become permanent following the completion of the project or indeed if any further changes were witnessed.

Certain consistent themes stand out in the responses across all sectors, together with some differences between and within sectors. The main message, regardless of sector, is one of IT having become much more focused on the needs of the business. The business was now driving what the ISp provides, not the other way around. The ISps needed to be more "business aware", and there are responses that indicate the 'gap' between IT and the business is being bridged, and that multi-functional teams are being set up to focus on the business requirements not just on IT capabilities. Other responses, a minority, regarded this as still an issue to be addressed.

Information management issues were now being addressed quite formally, as ISps tried to provide for the new information requirements of the new cross-functional processes. Steering committees and strategy groups were being set up to consider what the future of an organisation's information technology would look like in order to support the changing needs of the business with ever increasing advances in technology.

After BPR programmes in Group A (Distribution, retail and services) the role of the ISp continued to include supporting the functions but information management projects were being undertaken to ensure information was available where it is needed across the organisation. The concepts of Integrated Supply Chain Management and Customer Relationship Management were cited as evidence that the 'divide' between IT and the business, and between business functions, was being addressed. IT was now believed to be user driven and focused on adding value to the business as a whole.

After their BPR projects, organisations in the Chemicals and manufacturing sector were using their ISps to continue the work done on process improvements, working in teams with the business to exploit technology and provide what the business needs. The business is telling the ISp what is required, based on business requirements not technology. Responsibility for Information Management is also stated by one organisation as being a post-BPR role of the ISp. IM was now recognised as a key discipline in the cross-functional processes created by the BPR projects to break down

traditional functional organisational boundaries. Islands of information were no longer acceptable if a process crosses these boundaries.

In the Banking and Finance sector the role of the ISp again became more aligned to the business. ISps supported the business in partnerships, working closely with the business on projects providing technical experience and knowledge whilst the business focuses on business issues. Also, the ISp role had become more formalised, as it becomes more evident what IT could do for organisational effectiveness. Customer Relationship Management solutions were being developed, in keeping with the original aim of the BPR project to improve customer care.

Following the BPR initiative the role of ISps in the IT Sector was portrayed as much more about being customer facing and supporting the business in an era of increasing change. The gap between IT and the business that was evident prior to BPR had been eroded as the ISps had become more business-aware and the business people had become more educated in the capabilities of information technology to add value to the business.

The overall impression across all twenty companies and all four sectors is one of matters related to information management having risen up the agenda as a result of the BPR exercise. Consequently the potential for ISps to be more proactive, think more strategically and make a greater contribution to the running of the business was recognised by most interviewees.

4.6.5 Anticipated Future Role of ISp

The anticipated future role of the ISps within the respondent organisations was the final issue addressed in the interviews. Interviewees were given ample time to express their opinions, and every effort was made not to influence the responses. At no time did the interviewer use leading questions, and at no time did the respondent know what other interviewees had said.

A1 – Become more part of the business activity.
A2 – Process redesign.
A3 – Central control. Advice on moving IT to divisions.

A4 – HR and people issues. Proactive problem detection.
A5 – Systems integration, not piecemeal approaches.
A6 – Promote cross-functional collaboration.
B1 – Customer focused. Support for remote access to key business processes.
B2 – Review of how IT can add value. Must understand business – hybrids sought. Help add value to business.
B3 – Business leading change – IS supporting. Catalyst for change and integration.
B4 – Increasingly involved and integrated into business.
B5 – Help to provide dealers with knowledge. IS to work smarter not harder – focus on business objectives.
B6 – Future of ISp is locked into processes.
C1 – Continue to help business to change, and provide a structure to help the rest of the business put ideas in place. Customer focus.
C2 – Building long term relationships with business. Increased communication.
C3 – Use technology to provide "mechanism" to deliver market advantages.
C4 – Steering group set up to join business and IS. IS role much stronger as part of process development team.

A variety of responses were received from the interviewees, but the most consistent message across all industry sectors was that the future role of the ISp following BPR programmes would involve being even more integrated with the business. 'Hybrids' would be sought for this role in the future, as business change programmes would involve and sometimes led by the ISp. In fact one interviewee believed that the ISp will not only support change, but drive it as a 'catalyst' for change, using IT to add value to the business. The responses in many respects reflect a continuation and strengthening of the themes noted in the responses to the preceding "after BRP" question.

A mix of responses were received from the Distribution, retail and services sector as to the future role of the ISp, but the theme of becoming even more integrated with the business stood out as the most common comment. In the Chemical and manufacturing sector the responses clearly suggest that the future of the ISp was to be a business aware 'hybrid', working increasingly with the business to support change and also act as a proactive catalyst for change.

The Banking and Finance sector respondents felt very much that the future role of the ISp was to move closer and closer to the business, building long term relationships and helping the business to change. Technology would be used for competitive advantage, but the ISp would have a business and a customer focus, not an IT-driven

one. A variety of responses were received from organisations in the IT sector, including the ISp becoming more of a hybrid and more strategic, but still retaining specialist IT knowledge.

4.7 KEY FINDINGS FROM FOLLOW-UP INTERVIEWS

Despite differences in the various industries and the subsequent differences in the aims that various organisations had for their BPR initiatives, BPR was still the mechanism through which these improvements were sought.

The consistent message across all of the industry sectors was that the traditional role of the ISp had been to manage and support back-office systems which were often disparate and functionally divided. Even in companies which had been more cross-functionally aware the norm had been speeding up processes rather than reengineering them.

The main message in relation to the role of ISps during BPR was that in BPR projects the ISp had become much more involved in working with the business units. Their technical understanding was used to help integrate previously disparate business units and create new processes or redesign and streamline existing processes. Their technical understanding was used to help integrate previously disparate business units and create new processes or redesign and streamline existing processes.

In discussing the post-BPR period, the main message, regardless of sector, was one of ISps continuing to be much more focused on the needs of the business. The business was now driving what the ISp provides, not the other way around. The 'gap' between IT and the business was being bridged. Multi-functional teams were being set up to focus on the business requirements not just on IT capabilities. Information management issues were now being addressed. Steering committees and strategy groups were being set up looking at future of the organisation's information requirements. ISps were used to provide for the new information requirements of the new cross-functional processes.

As regards the anticipated future role of ISps, the most consistent message across all industry sectors was that the future role of the ISp following BPR programmes would be to be even more integrated with the business. It was suggested that 'hybrids' would be sought for this role in future and that these hybrids might lead the future change initiatives. In those organisations that did not speak of hybrids there was a variety of opinions as to whether ISps would support change or whether they might drive it as "catalysts" using IT to add value to the business.

When comparing these findings to those of the initial questionnaires, it is not surprising to note that there are many similarities between the two sets of responses.

In the questionnaire responses it has already been noted in Chapter 3 that the general view was that IS professionals should be involved in the change initiatives, substantial numbers believing that this involvement should be from the beginning of the change activity. Questionnaire respondents did however indicate that the IS function should not own or lead the BPR initiative, believing instead that the role of the ISp in BPR should be one of support and technology provision. This is somewhat in contrast to the actual role of the ISp as described in some of the follow-up interviews. These illustrate that where the ISps were involved during the BPR activities many of them assumed quite leading roles from an early stage.

The follow-up interview results also confirm a much more business-focussed role for the ISp than was obvious from the questionnaire responses. Respondents often emphasised the importance of information and information management within BPR, together with an awareness that proper IT deployment plays a crucial role in delivering in these IM requirements. The follow-up interviews clearly indicated the expected future role of the ISp to be that of a business-focussed and IT-literate 'hybrid' professional, working much more closely with the business and also acting as a catalyst for change across the organisation.

These findings will be further amplified in a series of short case studies based on further interviews with four participant organisations, one from each sector.

Chapter Five

Case Study Analysis

5.1 CHAPTER INTRODUCTION

The aim of the case study stage of this research was to further investigate the evolving role of ISps in four of the participating organisations, preferably one from each of the sectoral groups used in earlier stages. In fact, following the follow-up interviews the majority of respondents expressed an interest in contributing further to the research. It was therefore possible to select one case study company from each of the groups, based primarily on the promised availability of the relevant senior IS and user staff.

This stage consisted of conducting in-depth interviews with one senior IS professional and one senior user area professional who had been involved in the BPR work in each of the organisations. It was not seen as a requirement that the interviewees were the same people who had been interviewed at the follow-up interview stage. In practice it was sometimes but not always the case that one of the case study interviewees had also filled in the questionnaire and/or been the follow-up interviewee.

The key objectives of the interviews were:

- Validation and confirmation of earlier findings;
- To gain deeper insight into the BPR initiative and the role of ISps from the perspectives of both the IS specialists and the users.

Although they were asked if they wished to lead the discussion, all of the participants involved suggested the author chair interview and hence the author was able to progress the interview in line with the focus of data requirements. She summarised the data already gathered about the organisation, using the same overall structure as in the earlier follow up interviews (Appendix B):

- Aims of BPR
- Role of ISp before, during and after BPR
- Expected future role of ISp.

At each stage she solicited further comments for clarification and an expression of agreement or disagreement with the interpretation of the earlier data. When appropriate relevant points that had been discussed at other case interviews were injected into the conversations, without jeopardising the identity of the other participating organisations in any way. This proved an effective way of stimulating clarifying comments.

With the agreement of all interviewees the author recorded interviewees' statements and expressions during each interview, both in written note form and on audio tape. The tapes were subsequently transcribed and compared with the written notes. Where necessary follow-up calls were made to interviewees during the transcription phase for clarification purposes. The resultant transcripts and notes form the basis of the following analysis of the case study interviews.

5.2 CASE ONE – COMPANY A1

Company A1 is a major logistics service provider operating on a global basis. In May 1994 there was a 'kick off' meeting for the start of the European BPR initiative. The initiative was called the "Strategic Program (sic)" and the idea came from a visionary within the UK company. He oversaw the BPR exercise and was the director of the Strategic Program until it was regarded as "mature" in January 1997.

ISp's perspective

Cap Gemini consultancy group was brought in to assist with the change programme and they are still with the company today. The company had a very 'stereo typed system' and the concern was that the billing system was very separate from shipping system and from customer service. The interviewee stated that "if a customer called up about a shipment, they might receive a different quote from the one given in customer service." This was regarded as a result of the systems containing different databases. Therefore, the reason for reengineering was to integrate all these systems.

In January 1997, after success in Europe, the company went through another reorganisation with the aim of increasing the sharing of resources on an even wider level. The regions involved were Europe, Asia and Africa. The integrated system was extended across these territories in what proved to be the single largest investment by the company in the region and the second largest investment in the world.

Before the Strategic Program, there had been concern that business decisions were not being made in relation to the use of IT. The interviewee perceived that from an ISp's perspective there had been an absence of business drivers and business requirements. He believed that instead of addressing the business issues first, matters were pushed down to IT for technical analysis. In contrast the Strategic Program was about managing change in all aspects of the business - the business and the IT together.

The regional IT team had been responsible for maintaining the systems that the company used. The Strategic Program introduced new ways of handling this task, such as contract management, and the use of Gantt charts and milestones. However,

this was not regarded as "the main thing 'strategic program' did". More importantly, the program had led to the creation of the company's 'change management organisation'.

The interviewee mentioned that Strategic Program "took a hit" and did not succeed in its first attempt to reengineer the organisation as it was "trying to understand the business requirements before the business did, trying to develop the s/w etc.". This meant that IT was brought in after the business decisions had been agreed. The team realised that defining what was expected from IT at this stage meant that IT's contribution to the change was somewhat limited.

Post BPR the company now has a model in place that helps to determine the strategic business development priorities and is used as a "director for change". There is a change management team comprised of the business people and ISps. They articulate the business direction and handle frequently asked questions such as:

- "What do you impact when you do your job?
- What do you need to think about?
- What's a typical cost benefit?
- What's ROI?
- What's it going to cost?"

The change management group is responsible for handling change through stages of "Define - Develop - Deploy - Operate and Support". The teams ultimately report to an executive director who is a non-IT person and takes more of a senior manager role.

The interviewee indicated that teams were "going to change the business, as there are still 112 little empires" making it almost impossible to "get anything deployed". The proposed solution is to move to regional operations. The interviewee explained that "from an IT point of view, regional business practices have to change, but we still recognise that languages are different, currencies are different etc".

The company had come to recognise the power of "Business Process Improvement through Business Systems Integration" and that the provision of "Information Services is key to strategic IS/IT planning". It recognises that before "creating a proposition" the systems' implications "need to be aligned with other business initiatives". The aim is to eliminate a situation where the company starts another initiative that's going to cost a lot of money and find that it is not compatible with other changes that are planned. The interviewee believed that ISps within the teams will progressively assume "the role of integrators, avoiding this type of situation".

User's perspective

The interviewee began by explaining that the company had grown rapidly to become one of the market leaders. Initially the company had been able to adapt to its customers' needs and make changes. Eventually, however, the company had grown to a size that making these changes "ad-hoc and on the fly was becoming increasingly difficult". Analysis had further established that for each country to have its own systems and make its own changes was no longer sensible and there had to be more harmonisation of processes, hence the "Strategic Program".

Traditionally the business groups had viewed systems as "an information processing tool with a particular role". In the interviewee's opinion the company had originally employed an "unfocused business led IT" approach. The BPR project had led the organisation to adopt a different approach to "determining in what ways it should change".

During the "Strategic Program" it became apparent that there was the need for a group playing the role of "integrating the business model and designing a structured approach to change". Also, it was necessary for this team to help implement this change management approach throughout the region. The interviewee believed that the reasons for bringing the group together had been:

- "Complexity of change under the Strategic program
- Changing types of company targets
- Drive to continue profitability
- Also the company needed to make changes in order to get closer to the customers."

It had been recognised that the organisation needed to make changes throughout its business in terms of "how people are" and how "the company uses people". This was more than a "new system" it was "a true reengineering". The complexity of the changes needed the programme to be more structured and more focused than ever before. Hence a team-based approach had replaced the arms length "business led IT" approach.

At the time of the interview the company had created a formal "change management group" in each of its eight geographic regions. Change management directors have teams in each country to help implement change

These groups are responsible for articulating business directions within the organisation and soliciting "proposals". The aim is that everyone will understand where the company is heading and will help to frame and support any change initiatives. Therefore, the company has had to have more structure to the changes "not least with the relationships with the systems".

The 'change management group' comprises of members from a number of different backgrounds including business and systems. The group is not seen as responsible for a particular function or a process but rather for the development of a change management framework. The point about the framework is that if somebody was going through change in the past there was a risk that

"a) they might not get the scope right

b) not ask the questions that are asked in the framework".

The interviewee offered the comment that the framework is still being added to and that the area of performance measurement is perceived to be a weak area and the

change management team is still going through the process of articulating its position on this topic.

People who operate at the individual process level are the "process change managers" supported by a multi-functional business team, including ISps, working within the framework. The framework is regarded as a guideline for future change. What the team tries to achieve is a structured approached through the three phases of 'Define, Develop, Deploy'. 'Phase 1 and Phase 2' are concerned with business needs identification and proposition definition. This involves determining what the company aims to achieve and to assess if the proposal meet the expectations of the company. If it is decided that the proposed changes meet the business expectations then the group needs to investigate how the change fits within the overall change programme, "i.e. When to do it? How to put it together". 'Phase 3' is adopting and implementing the improvement and change i.e. exploiting the opportunity.

In the UK organisation the recent focus has been on Phases 1 and 2 "looking at any ideas for change to see how they fit with the direction and business needs and see if this is what the company wants to do".

As regards the future, the interviewee believed that ISps at both the "framework change management group level" and in individual process teams would continue to be concerned with assessing the business needs with a particular focus on systems and IT. The aim of incorporating a system and IT evaluation into the framework had been to ensure that when "anybody making a proposal or an idea for change should then say:

- Where do systems fit in?
- Can systems help?
- Are systems an integral part of the change that is being looked at?
- When are the IT people brought in:
- How much knowledge and detail do you need to have integrated into the group that is making change?

In this environment the possibility was envisaged of creating joint roles of 'business improvement manager' leading Phase 1 and a 'release manager' whose particularly responsible for the systems side and developing and implementing the system, i.e. leading Phases 2 and 3. Ideally at the very outset there would be a 'release manager' and a 'business improvement manager', with the responsibility shifting between them as appropriate.

On the specific perceived future role of ISps, the interviewee reiterated that this would depend on the nature of the initiative and the time at which IS involvement would be appropriate. In general he expected that the ISp would operate within the team and "would be a person who has the knowledge and the responsibility of saying what systems can add to this change". When pressed the interviewee described the most likely future role of the information specialist, in relation to the rest of the activities in the organisation, as "concurrent engineering, that is to ensure that information systems align with the changing business direction in order to secure a successful overall outcome".

Company A1 – Combined view

In this company the views of the IS professional and the user were remarkably similar and very much in line with the earlier findings. The two interviews, conducted separately, added detailed insight to the follow-up interviews, but did not lead to any significant changes in the earlier conclusions.

As regards the aims of the BPR work, both interviewees noted that although the company was already successful, there had been an obvious need for greater collaboration between operating units. They both identified traditionally disparate systems, tied to individual geographic regions, as a weakness. The need for greater integration and better information sharing was noted in both interviews.

Using different terminology both the IS specialist and the user categorised the role of ISps before the Strategic Program as being:

- Separate from the business;
- Regarded as a managing process in its own right;
- Responsible for disparate back-office systems.

With the advent of the Strategic Program a major cultural shift had been observed, initially involving Cap Gemini, whereby:

- Change teams became the norm;
- IT's role became an element of a change initiative;
- Cultural changes to structure, rather than technological change were given prominence;
- Replacing old systems was part of a wider exercise;
- Money was not an issue, but converting existing system was technical challenging (but this is easier than cultural issues to deal with).

The current and anticipated future role of ISps was seen by both of the interviewees as:

- Part of the highly structured "Change Management Framework";
- Focused on business process improvement through business systems integration.

In this company there is very clear evidence, from both the user and the IS perspective of a major change in the way the company has come to view the role of ISps. One lasting effect of the Strategic Program is that integrated information systems have been recognised as crucial to harmonisation, and ISps are and will be used proactively to achieve this harmonisation.

5.3 CASE TWO – COMPANY B1

Company B1 is a major pan-European petro-chemical company, formed from a merger of UK and continental European predecessors. It operates in both the refining and retailing sectors.

ISp's perspective

The view of the IS professional in relation to the aim of BPR within the company was straightforward: "To streamline and integrate disparate business units to help minimise any redundancy in business operations". "There was a prize, a certain amount of money (I can't remember the exact values). That was based on how much money we were going to gain through using the best practices. IT were given a share of that and we were told that we had to prove that IT could deliver in order to gain our part of that prize."

This requirement for simplification in part related to the recent merger but was also addressing an issue that already existed in the individual companies. The interviewee had been working directly for the chairman of the earlier UK company, as the Head of IT, before the merger took place. The company had had problems with users demanding support for various technology tools that were not compatible with each other and did not conform to the few organisational systems policies and standards that were in place. For example, users used to "go to Dixons and buy a Pentium PC and when they came to us for support afterwards was the first we knew about it". Any attempt at standardisation was fiercely resisted, and "in some cases the response from the guy was 'well if you give me this I am resigning. I have been with the company 30 years, I don't need one of these'". This was seen as wasteful and unnecessary. The interviewee believed that the in the early days the independence of users "had been overdone".

To shift away from this type of mentality proved difficult, but was necessary. The decision to reengineer the company's business processes, emphasising integration and simplification, had provided an opportunity for also reviewing the all practices related to the use of IT. The interviewee had therefore pushed for a major revision of the role of IS, which he believed had now been achieved: "It's only afterwards that what I had been saying is echoed by other people in many different areas". The interviewee claimed that it is now recognised that IT has a value to offer and the area is no longer viewed only in terms of its cost.

In reference to the role of ISps during BPR the interviewee believed that people had been very appreciative of the role that IT had played in communications, in business reengineering and in everything they had been involved in during the BPR programme. He maintained that " the businesses realised that IT had actually made a contribution to the project". He used an example to illustrate this: "250 people left Hemel (company headquarters) on Friday and when they reappeared here at 9am on Monday to their amazement their PCs on their desks were in full working order and actually logged on. We had two and a half days to do this. People appreciated it in that we had lots of letters back from senior management saying yes, thank you to the team for doing it. Because if they had come in on the Monday morning and it had not worked then you would have started to talk about the business collapsing. Everyone was committed. They were aware of its importance in terms of persuading people that ISps actually do have a role to play. Hopefully we proved it".

The interviewee stated that during BPR he and his team had had to "learn lots of new things, because my background is application development". For example, since a commercial Enterprise System Solution was being deployed as part of the BPR exercise, there were more consultant IT staff than in-house staff working in the organisation at some times. Some other activities had been also been outsourced to Oracle and to IBM with a significant impact on the data centre. However, as Oracle wanted to retain their skills "most of the people who left on the Friday afternoon as company employees came back on Monday as Oracle employees".

In discussing the role of ISps after BPR the interviewee made several points. The trend towards downsizing was now being reversed. At its lowest the company had an internal IT department of 15 people plus about 5 part timers, whereas now there were 52 people and the company was recruiting. The interviewee suggested that this was further evidence that the "businesses are realising that IT needs more people to meet the business demand". Within the IT department recruitment was into the business support groups including general Enterprise System support. Also, ISps worked with a group who handle end-user computing and on application activities such deploying Visual Basic. This applications development group was coding and developing the system but usually it was the user project leader who did the design specification.

As far as policy and standards are concerned in this organisation there are now some global standards in place, "it's a bit of a mixture really. For example, there is a standard desk top environment, standard networking environment which is called COE - common operating environment. This is so that any PC that is provided would have this standard Windows 95 based, NT based system, whether it is a lap top or a desk top computer.

It only depends on whether the technology itself could have a global impact, for example, use of the Internet. We have our Intranet which is a very useful system. People again are trying to get the businesses to work together to come up with a common method of approach to this, rather than have everybody wishing and doing their own thing and deciding things in their own way. So again there are various groups that you have to talk to if you want to do anything on the Internet".

As regards the role of ISPs today "The company has recently split into five business units. There is one organisation for retail, one for lubricants, three for commercial fuels and each of these business units is responsible effectively for its own bottom line and their own managers have their own performance contract so its up to them to try and get each of these units to work effectively". The interviewee expressed concern that with such division in the organisation each business would have their own agendas for their IT requirements.

On the other hand " I don't hear people winging and moaning about their IT budgets and how much it costs. Everybody is aware now that as soon as your laptop breaks down you want someone to come and mend it. So they are now aware of the costs more". The interviewee confirmed that each business unit has to cost justify why it needs IT. "I'm looking at a particular project at the moment, which is a European project, and we charge the cost of that project, all the IT requirements, everything, back to the businesses. There is no actual residual cost levied to IT at all".

The different business units include IT specialists who work with central IT, and outside consultants from CSC and IBM. "So they have their own systems people and they will employ outside consultants as ever they see fit. They won't necessarily always come through to central IT if they want to employ their own consultants; it's

their money, they can spend it how they like. But, for general support (certainly at the moment), they look to us for example for desk top support and network support".

Asked whether the BPR experience had led to a change in perceptions as regards the role of information within the company, the interviewee replied: "Absolutely, there certainly was, it was a big change". This comment was expanded as " this organisation has seen a shift in attitude as now end users are encouraged to involve ISps in finding a solution rather than providing tools, which may or may not be the solution". "I think now we always try and say to people, bring us your problem not the solutions".

On the question of re-skilling the comment was made that "Certainly there has been a lot of additional skill required, in terms of getting everybody on to NT for example, and then there is '95. These are the very basic standard training matters we have had to acquire". Outsourcing had, however, reduced the requirement e.g. "we decided that IBM would continue to run the help desk here. IBM have trained a lot of their people in NT, Windows '95 and so on from a technical perspective. This is regarded as an advantage of having outsourcing, if you ever change technology, you just go to your outsource partner and say 'we just change to this now' so you re-skill accordingly. They have the training and re-skilling problems to sort out not us".

Describing the anticipated future role of ISps, the interviewee started by commenting upon the reduced cost of the IT/IS activities of the company which he perceived to be related to the adoption of the new client-server Enterprise System design. The interviewee reflected that there had been a number of issues relating to the use and adaptation of the organisational Intranet and Internet. "I had to get somebody to talk me through a very long spiel to get access to the Internet as opposed to our Intranet". He explained that everyone now has access to the company's Intranet but now there are a number of difficult process to go through to allow the links to work. It is possible to go via the Intranet into the Internet itself, but this is strictly controlled due to the fact that the Internet had "a lot of bad press", hence people are very keen to make sure that there is no misuse of it for whatever reason. "I'll leave that to your imagination".

However, the Internet is regarded more as an information type system and is not used in for doing business. In terms of the future role of the ISps, he argued that it will focus on applying this new technology and that in general it will remain the same because "we still have desktop support to provide, network support to provide, we still have transactional system support to provide, we still have individual projects to run and so on for the businesses and whereas the underlying technology is now different from when I was with the separate company people still need their PC to work properly and they still want someone to phone when it is available". The interviewee also believed that ISps would continue to be a mix of in-house staff and outsourced resources. "So again what's happening now is we are looking at I think three alternative suppliers, the aim being to try and find a world-wide desktop support company to actually find support for the whole world starting off with the UK, work across Europe and then hopefully, eventually, have a global situation where we have one global desktop supplier".

"The project I am working on is a customer management system and that works with remote salesmen. They have a copy on the laptop that they will use. Certainly in some countries, they have never had computers out in the field at all and they have been supplied with laptops to work on. Obviously they have to get used to not being frightened of pressing keys so there is a whole training to be gone through".

The interviewee predicted that "that is certainly the way, I have noticed, the change will happen, the rate of change is accelerating which is again a function of technology". "It's just that as soon as you get a new tool that makes life easier for you to exploit it".

User perspective

Asked to explain the aims and origins of the BPR initiative the senior user representative, somewhat surprisingly, stated that he was not sure that he would use the term BPR for what they had done. However, the organisation had a project called the 'staff redesign project' (SRP). This project was driven by the chief executive with the specific aim of reducing the organisation's corporate annual expense by $4 billion. "In most respects it related to losing 4,500 people world-wide. These were people

from the support areas rather than the front end in any of the business units". Therefore, the interviewee suggested, "if the company had done a proper re-engineering exercise they would have considered the project as completely new and ask what could be done from a clean start. But we have done that in the past and made huge mistakes. This time we needed an evolution, first get rid of all your waist processes". Process simplification was what emerged as the means of achieving SRP, not the aim of it.

The organisation conducted a feasibility study which took approximately 12 months and identified the jobs to go and it was left to the regions to implement that strategy and reduce the numbers down to the specific quantity per support function. At the same time the merger took place. This built as an additional $400 million saving into SRP's target by the combination of activities of the previously separate companies in Europe in 43 countries.

The impact of the merger had been that wherever outsourcing was previously recommended or significant reduction in staff numbers was sought, and where one of the companies had already outsourced these activities, preference was given to the existing service provider. For example, one company was well known for having outsourced certain activities to Andersons and all the other side of the business now did the same. This was part of the attempt to simplify and standardise
In terms of the company's approach to IT before the SRP project, "systems were seen as more of a problem than a help to the business". One of the companies had developed its own system for running the business and "When they did that, they made a conscious decision that they were going to have to do all the forward development as an in-house project rather than rely on some outside vendor like SAP. They then licensed the system to Oracle. "So, instead of our own in-house flexible system, we now got an externally supported system which might or might not find other clients, and even if it does we will drive its development in the way those clients on aggregate want to do it rather than the way our businesses want to use it". Rationalising the use of IT was a key objective within SRP.

The approach to the performance improvement exercise and the role of ISps within it was described as follows: "They set up teams in each function. Purchasing had a team

based in Singapore, people were nominated to it go from U.S, Europe and Africa and sat there for six months mapping the processes, those of today's processes and the ones considered optimum".

The principle behind the optimum design was to think "I want to put ownership very much back into being a line responsibility". This was tied in with the line managers becoming much more responsible for their core bottom line performance. In the past too much of the workforce had staff functions. HR was said to be an example of this "far too much was being done by staff groups". Therefore, on the HR side the line managers were abdicated all responsibility. In the UK there were staff 19 people in HR at that time and the process mapping recommendation was to go down to 4.

As regards information systems before process simplification, the interviewee suggested that the previous system provided sufficient, and in some cases, more information than required. The issue was, in his opinion, one of attitudes towards what information the company actually needed for decisions to be made. "I had more information about the business than I do now and it was more readily accessible. But do we still get information to run the business? The answer is yes. And this is now beginning to answer your query". He believed that the company in the past had been suffering from information overload and believed that too much information had been asked for. "That is how we looked at the systems. I can say that I have less now than I had five years ago. A prime example is that we were given three monthly forecasts. One was the actual monthly results which we gave eight working days after the close of the month. And another one was the last day of the month. Furthermore, the company information was not perceived to be very accurate. Therefore, it was decided to produce another forecast rather than to try and get greater accuracy".

The clear role of ISps, both internal and in the form of consultants and outsourced resources had been to support the process simplification exercise and move the merged company onto a single, much simpler and more cost effective information system. "It will obviously reduce the future development cost". His assessment was that the resulting system "provides most of the functionality needed by the area of the business. Some elements of the business needed to change the way their processes were conducted but the current system (ISP) is far cheaper and therefore the changes

as seen as economically valid". The interviewee suggested, however, that the role of the IT specialists during the reengineering had sometimes been, in some ways, more inhibiting that enabling. He reported receiving responses that included "In May next year I'll do what ever you want, but right now we are losing 450 people in the UK".

The interviewee suggested that overall most aspects of the business had managed to improve "because there is less people "interfering" with the process". He believed that there is now a clearer view within business processes of what is expected regarding the provision of information.

However, as regards the future the user manager expressed concerns that past errors might be repeated. The corporation had now decided that it wanted to install on its desk-top equipment standard managed environment so that all users have the same software. The interviewee argued that "that's great, but the company has no vision and no right to except that all users to have exactly the same system. I have got users up here and users down here. And they never turn their machine on". "So we are going to get into massive down loads of information on to large PCs in order still be tracking the business. But we are employing more people to do that, not less. The difference is the speed at which the company can react to pressure. Therefore, there is once again a need to change the system but once the fundamental design is altered it may result in complexity".

Recently the organisation had recruited a person into the senior position at the corporate level who is expected overview the information system strategy. Development activities, however, are project based. When a task is to be achieved skills are brought in from various areas of the business, including IS/IT. For example, in a purchasing operation project it can be decided which skills are needed, and where they are needed, however, the control lies within the line for project management. "In the first instance they regard IS as a shared service unit, which is effectively an outsourced entity. Shared services will then talk to our residual IT people, of whom we have six or seven left in our business. They also talk directly to the business group. So we have user project staff, outsourced ISps and internal IT staff working together".

" The perception is that the information is within the business and they should determine how that information is developed. The company is aware that information is critical and must be analysed from the transactional system".

Combined perspective

In this case the interviews greatly enhanced the researcher's understanding of the earlier findings. Consequently more time was spent with these interviewees in terms of further questioning. The overall results' analysis was not significantly affected, but a deeper understanding of the responses was achieved.

The ISp and the user manager were both very clear that the aim of exercise had been to improve bottom line profits. However, the ISp explained this in terms of the aim:

- To streamline and integrate disparate business units;

whereas the business manager saw this as being purely the way to achieve the real aim which had been predetermined as:

- To reduce costs by shedding 4500 jobs.

He therefore questioned the use of the term BPR to describe what had happened, preferring to think of it as :

- Getting rid of our waste processes.

The interviews also explained the relevance of earlier comments that there had been:

- No policy and standard for purchasing computer hardware and software, users deciding what required and purchase accordingly;

And that therefore, before BPR:

- Users just expected their ISps to support disparate systems.

As regards the period during the change initiative, the interviews highlighted the fact that, as with other activities, standardisation of IT/IS practices and heavy outsourcing had been used to achieve the target headcount reductions. A significantly reduced in house IS/IT group, working with Oracle, CSC, IBM and others had undertaken the tasks of:

- Helping to identify where processes could be simplified;
- Creating an integrated environment through which disparate business were units enabled to access and process information using centralised systems;
- Introducing organisational standards and policies for purchasing and supporting of technology tools.

As regards the future, both interviewees concentrated on technological changes:

- Due to the increasing numbers of workers requiring remote access to enable them to work in flexible manner, the future ISp will have to ensure support for such working environments.

Both also expressed concern that with the emergence of new business units there might be a return to the old problematic situation of diverse, over complicated systems and processes. Neither interviewee seemed confident that this could be avoided. Despite some of the comments made, particularly by the IS professional, that the company now valued and involved its ISps more, the researcher concluded that the role was still seen as a primarily technical one.

Overall, the impression the researcher was left with was that this company, more than any other studied in detail, was still coming to terms with the role it expected ISps to play. Furthermore, this appeared to be related to a lack of clear vision as to how the company itself should operate. During the reengineering when there had been a strong emphasis on process simplification and cost reduction there had also been a clear role for ISps in helping "get rid of our waste" rather than carry on supporting diverse and wasteful systems. There was no evidence, however, that the company would now capitalise on this by using its ISps to prevent the reoccurrence of unnecessary process complexity and waste.

5.4 CASE THREE – COMPANY C1

This company is the UK subsidiary of an international banking and insurance group which operates globally but has its world headquarters in Europe.

ISp's perspective

The BPR initiative started about two years before the interview. It was in the company's 'new business' area, which is the largest of the company's business areas. 'New business' involved most of the company's processes and people. The interviewee stressed that:

"Why did we decide to do Business Process Reengineering? Well it wasn't because it was that year's buzz word. Everything you opened at all these seminars was talking BPR. But that's not why we did it". The interviewee also indicated that undertaking BPR was not seen to be end in itself rather it was seen as a means to an end. He commented that reengineering was a result of a continuous strategy to respond to market changes.

'New business' was the most obvious area for improvement. This part of the business offered the most significant scope for savings and improvements as it included many manual activities and was difficult for the operators and clerks to remember all the rules and procedures that need to be applied. The interviewee emphasised that it was critical to this company in a very competitive business that new business processing was as efficient and as productive as possible.

In the past some of the decisions coming out of underwriting new business were somewhat inconsistent. This was causing a lot of aggravation with people who were supplying the company with new business, known as intermediaries. The company operates through these intermediaries. "So, if you are the end customer, you will go to an intermediary and he will advise you to come to us [the company]".

The organisation began their reengineering exercise with the new business element of the underwriting process, and this involved examining the process activities to determine areas that could be improved. "We wanted or we needed to cut costs

dramatically because the sort of business that we run is very cost competitive. He further suggested that if an activity involves many people in the process then most of the cost would be spent on employing those people. "So we needed to cut cost to improve productivity, we needed to speed our turnaround times because speed is another important issue. A broker, for example, may refer the same proposal to more than one life office and if the first one comes back and says: 'yes, okay, it's clean', they are going to get the business. So speed is very important. I mentioned already that we had far too many manual activities, so we needed to alter those, not strictly speaking the process, but obviously it's related to it, so automation was a key requirement". Another area identified for improvement was consistency in the decision making process, and it was also recognised that 'better' management information was needed. The interviewee confirmed that "survival is probably the best way of putting it. But a lot of other issues were related. It is a fairly flat market. It's pretty static".

In describing the role of ISps before the BPR exercise the interviewee suggested that the company was in a business which naturally emphasised the importance of effectively processing information. The company's product was in fact information. The traditional role of the ISp had been that of automating the information processes. It had tended to be reactive to changes such as legislation. But with the arrival of direct selling "Now it's Tesco, Sainsbury, Virgin, you know... anybody who can spell 'life assurance' is at it!"

This had had to change. "We knew we had to do something to make it more efficient, faster, quicker, easier, cheaper and all those things".

At the start of BPR "we did look at the whole process and map it all out. Actually I did not do this but the guy who was responsible for new business generation. We did use consultancy to help us with this." "There was one guy from this consultancy firm who has written a book on this subject. We got to know him through the general company, the general insurance. They had used this consultancy and recommended them".

The reengineering exercise was led by a team that was set up by the business community, including the external consultants. The internal ISps were also involved because it was seen as the "natural thing in this sort of company where systems, our existing computer systems have a very big influence of course on the way the company operates. So we [ISps] would be some of the few people who would know what actually happens". The IS team was responsible for designing and developing systems in response to the need of the business "So we were involved in that in terms of documenting the process".

The interviewee then reflected on how the role of ISp had evolved as the reengineering project matured. "Generally speaking I would say that IS in our case initially play a rather passive role. Users were always coming up with requirements and demands and we satisfied them as much as we could rather than turning around and questioning them. And this was the case initially in this particular exercise it was triggered by the business needing to look at its operation and involving systems and as the thing progressed we took on a bigger and bigger role in that".

"We did process mapping. The process 'as it was' and the process 'as we would like it to be'. So we had a target to go through. It was quite complex. For example, I just mentioned management of information. Now in different ways that is crucial to most businesses of course. In our area we write what is called 'term' insurance. The point about this is that it invariably requires underwriting. And that usually involves you going through a medical. So we were sending off almost all of our customers to have medical and our actuaries began to say 'hang on'. Therefore, this process was questioned and the actuaries proposed 'if we knew better what the situation was, we might be able to change the way we do this, we might send 90% of them for a medical and we lower the premium for 10 or 20%'. We started with the process, we took input from the actuaries and from other areas who were involved in this process, and we redesigned it". "Also, it transpired that when we came to ask the underwriter, 'what happens there', it just went into this black hole. It appeared that the knowledge and know-how to process the applications for new business was in the heads of the underwriters. What they did, how they did it and what the rules were. This is an example of added benefit in that for the first time they managed to document the process. And that's quite a remarkable experience really. To think that such an

important aspect of the business was never fully written down. No wonder we got an inconsistent approach". Process Reengineering became seen as the route to finding out what the company should do and the way it should do it.

The interviewee explained that there was a particular technique you used for process mapping and that this was introduced by the consultant. It was "brand new to the IS here". "The big differences were in the associated processes, i.e. involving key users and bring them in to teach small groups on how they would work. It was that aspect that I would say. Also it would not be a one off. Once we have done it we would want to continue, continue improvement, moving it on to the next stage". Thus ISPs were actively even though they were not the initial drivers of this exercise but "very interested in it and willing to get involved and make a difference because we can see in which areas we could really do something".

The interviewee also reported that as the BPR exercise had progressed and that in fact the systems people began to take a bigger role in project management. He believed that this was an inevitable consequence of the fact that "systems people working in a project have to prepare and plan for resources. Hence, the more the project moved forward the more their work increased. What I find is that the users are very good at having an in tray and ending up with an out tray, one by one, you know that's where their strengths are. What they are not very good at is project work. They are very poor at that". Eventually the IS team formally took over the role of project manager, defining all the tasks and the resources required scheduling it and monitoring progress, "all those sorts of things that were meat and drink to us. So that's another service, if you like, that we provided".

Also at this stage the IS team became more involved in "determining the connection activities. Connection between the different business areas was seen to be very important. In fact, in some ways we operated like a third party. The new business people would be frustrated with the underwriting and underwriting would not understand the requirements of the other side. So we would be the third party in between".

Overall part the role of the IS team in the organisation "became that of enforcing a discipline, it was managing the project, co-ordination between the areas, bringing in new techniques (not use in the way IS used it here)".

In describing the ongoing role of ISps after the belief was that "The ISps do a good job at innovation. Looking at it afresh we did find that people who have done this A to B, A to B, day in day out find it virtually impossible to think of it any other way. If you were to say well why not go from this side to that side? [they would say] 'can't do that'. I had a great problem with that, but in effect it was not really that surprising. What we want to do, is not just to automate what they do now. We want to redesign how to perceive the automation".

The IS team has now introduced workshops. "Again all very standard stuff but not something we used previously. To get these people together, to get them out of their working environments, to thrash things out". Although, the idea of educating users through workshops proved slow to get off the ground it has developed. The more the users became involved the more open their minds became. As a result users started to think of more radical ideas bouncing off each other. The IS team provides the users with the opportunities and it in the right environment the users could deal with change situations. "When they [users] are head down and not communicating with people in the same way then it does not work. So the changed environment (IS-led workshops) gives them the opportunity to think differently".

In linking the evolved role of IS to the BPR new business initiative the interviewee commented "There was something special about it that it was so radical. It's pretty obvious that these thoughts had been going through our heads for some time but there was just no way of delivering it. I have to say that it was not the Business Process reengineering that came up with this brilliant idea, that was already there in disguise all the time". Describing future developments the interviewee commented that "The culture is that ISps will demand that business professionals become involved during the project at hand to ensure the business needs and systems work together towards the same vision".

User perspective

The interviewee explained that the organisation's senior management determine the approach that the business takes to strategic planning and to setting corporate objectives and the individual businesses follows these strategies. "All decisions come from the HQ and that the Chief Executive Officers (CEOs) are introduced to the initiatives such as BPR at their conferences. For example, the CEOs are told about the need to manage costs down, get productivity up, to examine working practices and to eliminate unnecessary cost".

There was a clear need to respond to market pressure. "What's been happening over the past few years is that all sorts of companies have been coming in (to the insurance market), turning it into a bit of price war, and as a result some of the premiums have been coming down in quite big chunks". This was reinforced by the fact that "Technology has made it easier for the intermediaries to check competitive positioning. Financial advisors and intermediaries use a system known as "Xchange". Therefore, if for example they wish to conduct research with regards to term assurance or any of the major products on the market now they are able to log on to this service and they are provided with a league table of the premiums that any of the assurers in the country would charge". This was particularly important because the case study company did all of its business through these intermediaries. It had recognised that technology was becoming something of a competitive tool for insurance companies to use and that BPR was "fundamental to what the company does and, how the new business is processed through intermediaries".

The company's strategy had been to emphasise the quality and reliability of its services. As an example of the company's success in this area the interviewee said that the company had won the service award which "in our area is the equivalent of Oscars". The company has over the years won many awards for service " where financial advisors have a vote this company tends to receive a positive response". The company used the recognition of their services by promoting their awards on their literature and stationary.

As regards the origins of the new business re-engineering project the interviewee expressed some lack of detailed knowledge. "If I remember rightly our BPR exercise came about at a time of, I'm not sure if it came about because of, but it came about at a time when we had become particularly busy. Again it's in the nature of our business that if we are competitive we'll be very busy. If our premiums are good we'll be very busy". It had been recognised that if the company continued as they were they would need to increase staff levels in line with the business volumes. Further, they would not be able to be contained in the current accommodation.

It was decided therefore that the company needed to examine its practices because there was evidence that the level of staff in relation to transaction volumes was relatively high. In addition, the company had to compete on cost and maintain the service. "We had to be quick and we had to be very slick".

In discussing how things had worked before BPR the interviewee noted that he been in his role for more than 10 years and he believed that the role of IS had changed considerably during that period. Originally the whole new business process had been manual. "Staff used to have races to see who could get through the files fastest before the computers were introduced. That changed. We bought this system called 'CAPSUL', a package which we bought just over 10 years ago now". When the company first purchased the system the role of ISps was more a question of understanding and explaining the CAPSUL system rather than developing anything else. However, the interviewee reflected that over the subsequent years the company had customised CAPSUL to suit its business. At this stage the role of the interviewee had been "like the liaison between systems and the administration". "Systems were designed for the liaison person who understood the business working, leaving the systems analysts to devise the systems".

However, over the intervening years is the company has expanded the role of system analysts and taken on analyst programmers, and there is not a liaison person any longer. "Now the business users are responsible for the processes they are operating and identify opportunities and what could be systematised. At this stage business users discuss this with the systems analysts, and there is not a person in between anymore".

As regards roles and responsibilities within the BPR initiative at its very early stages, top management identified the need to increase productivity if the business was to grow and be cost effective. That need was communicated to the business area. They appointed the manager to conduct their BPR exercise with the aid of a consultant. However, at the same time this was underway, the users were already working with the internal systems people to design a 'new business' processing system. The two initiatives then merged, and it is a question that is often debated between the Head of New Business and the BPR project leader as to which came first. The business manager claims that he had already identified the fact that to improve productivity they had to change the way we worked before the BPR project was officially begun. However, "what the BPR exercise certainly did for business was to identify that in addition to systematising the process it would also be possible to train more people to use more of the functions within the system, and by less specialisation productivity would increase. For example, there is a legal requirement on the company to check for any case of money laundering. Previously this was a highly specialised activity but during the BPR review it was discovered that all the parameters were capable of being systemised and that the check could become part of the normal process".

Discussing the future, the interviewee noted that a committee now existed to oversee future BPR activity. The key parties involved were the Chairman, the Head of IS, the Head of Business Operations and the project leaders of individual projects. The interviewee believed that this approach worked very well and indicated that the recognition for a close working relationship between the various business areas and the IS professionals.

Project would report regularly to the committee regarding progress. "The actual nitty gritty is dealt with by representatives on the teams and the report is an opportunity to involve people and get used to the idea of working together". "One of the things that I have learnt over the years in dealing with systems people is you don't tell them how to do something, you just tell them what you want and ask them how they think we should do it. And sometimes you have to say 'I don't like your solution, can you try something else'".

Combined perspective

This company's experiences are particularly interesting from the point of view that both the ISp and the user stressed that the nature of the business demanded a process focus on all of its activities. In fact the company was in the business of "running a number of processes", one of which was new business underwriting. Of the four case study companies this was also the one which had concentrated on a very intense review of an individual process in an individual business area. The findings from this case are therefore very useful when compared with those of the other more wide-ranging BPR initiatives in sectors which are less obviously process oriented.

The case interviews confirmed earlier findings in terms of the drivers behind BPR. Both interviewees stressed the following points:

- The need to cut costs dramatically, to survive in a very cost competitive market;
- The aim to improve and streamline processes and increase processing speed and throughput.

There was also agreement that over the years there had been a growing understanding of the role of computerised systems and of ISps. Both interviews revealed:

- Computer systems having "very big influence" on the way the company operates;
- Effective systems being a differentiator in respect of service quality and responsiveness.

There is clear evidence from both the IS specialist and the user of a progressive evolution of the role of ISps during the BPR project in the following direction:

- Working more closely with the users;
- IS team involved in BPR became "the natural thing in this sort of company";
- Increasing responsibility for designing and developing systems in response to the needs of the business;
- Process mapping: "as it was" and the new process design;

- IS growing into a role of connecting different areas of the business;
- IS team taking role of Project Manager, because of skills and experience;
- Defining all tasks and resources required, and scheduling and monitoring progress;
- Bringing in new and innovative techniques, such as prototyping;
- Persuading and educating users;
- Running workshops;
- Enforcing process discipline.

Building on the successful BPR project it was expected that the future role of ISps would involve:

- Role formalised with the setting up of an IS steering committee;
- Sharing and helping in problem identification;
- Proposing alternative solutions;
- Running each proposition as a project, with deliverables, milestones, costs, and the involvement of relevant business professional during systems design and development.

It is interesting to note, however, that the user perspective was still one of having the final say in system design and the authority to tell the ISps "try something else".

5.5 CASE FOUR – COMPANY D1

This company is a global blue chip organisation involved in computer hardware and software development manufacture and sales and in IT consulting.

Unfortunately, despite the fact that the company was chosen on the basis of the apparent availability of both key information professionals and user staff, changes within the company resulted in only one of the interviewees being available. However, this particular individual had started the BPR project as a user and during the project had changed roles and become a senior ISp. This switch was possible because most people within this IT company are highly IT/IS literate and experienced. He was also very highly placed within the organisation and could provide a senior manager's insight in the background to the project. He identified himself as "one of the key players in the change programme" and offered to spend as much time as needed to make the case meaningful. Whilst this situation is not considered ideal, the researcher decided to proceed with the case study interview on the understanding that the interviewee was willing to attempt to answer questions from the dual perspectives of information specialist and end user.

Combined perspective

The interviewee commenced the meeting by emphasising that this company regards its change programme to be a '*business* reengineering' exercise and not a '*process* reengineering' exercise.

The company had long had a quality approach in place that has supported ongoing quality improvement activities. The interviewee maintained that "the company had been running quality programmes long before BPR was considered" and that by the late 1980's the company was already a quality literate company and had its 'ISO' registration. 750 staff were involved in the company's quality circles and they "never needed to be told what to do and they would report back on what they had done".

The company was one of instigators of the "Management of 90's programme" run by the MIT Sloan School research group, investigating key management challenges for

post-Total Quality companies (See Chapter 1 above for reference to this important research initiative). The result had been the business reengineering initiative, which had involved but not been confined to process reengineering. The interviewee stressed again that staff were very process literate before the change initiative. The programme was stated to be business driven, reflecting changes to the company's markets. The interviewee noted that "all these new opportunities and markets require different response structures and because they are markets and businesses themselves they require different levels of maturity". He further believed that "this is very complex and exciting".

In setting up the change programme the company did not start by saying that "we have got to re-engineer our information processing system". However, they believed that they were spending a great deal of money on IT Systems. In this organisation the term 'IT Systems' is used to describe the functional area that is responsible for information systems activities. At the initial stages "the company believed that they had an IT problem". However, soon after "they realised that they did not have an IT problem". The company then "identified that they had a process problem". The interviewee explained that "what the company had not previously done was the alignment of IT Systems and business processes". However, the company had "customer care programmes and people who understood the relevance of process of Information Systems". Thus the question for the company as part of the business change programme became "how do we know that IS is actually supporting the business, i.e. how much value are we getting for our investment?"

The interviewee also reflected that a key factor in the change programme was the fact that the company "realised quickly that there was no point in realigning IT with their processes that either were wrong or inefficient". BPR was therefore important within the overall programme i.e. "revising processes and bringing IT Systems in line with the new processes and new markets".

The interviewee discussed the lack of focus on role of ISps in the past. "There always used to be a conflict and quite often what used to happen in the company was that the IT system in the early 1990s was more driven by reporting requirements in the

organisation than the operational requirements". This may be an indication of the lack of recognition of what IT may be capable of offering the business.

In describing the role of ISps before BPR the interviewee explained that "In the past there was a functional IT strategy, e.g. a marketing IT strategy, an engineers and R&D (research and development), manufacturing, logistic, services i.e. the wrong way of providing services to the customers". When the IT system was functionally driven there were different systems run which were separate from an application point of view, examples included a manufacturing type MRP system, a billing system, a field system, and a customer service system, none of which were linked effectively. Prior to the BPR exercise the "IT system was responsible for separate information processes".

"IS in the company was a compromise between the mapping of the IS on to the organisational structure and the mapping of the IS on the operational processes". The interviewee explained that he believed that "These are two different issues; the organisational structure is there for management, people, structures, supply products and services to customers through activities such as the supply chain process". Furthermore, he added that "the supply chain process is independent of the organisation". However, "the customers are not concerned where these activities lie" nevertheless, the IT system had been mapped these activities. As a result of this the interviewee believed that "most of the systems in the early 1990s were not systems that could be flexed to match revised processes". Moreover, from the experience of the interviewee, "in most organisations IT systems is a 'blocker' to the reengineering of their organisation". This, he believed, had been the case here, but that this had been recognised during the change programme: "because the IS team came from an engineering background they realised that IT could be as much a 'blocker' to change as it could be an 'enhancer' to change". The interview explains that "the traditional thought was an organisation has certain functions: logistics, manufacturing etc. But no one thought that you do not do business that way and most of them when it came to reengineering their processes found that their IT was a block"

As part of the programme it was regarded as "important for IT architectures to be able to identify where the company needed to have stability within support the system".

Connectivity was also a key requirement that was addressed. The interviewee illustrated this by reference to supply chain activities and systems.

He stated that "the organisation used to have a logistics group which was the HQ group and a manufacturing group which was a separate HQ group". The interviewee stressed that "they had extremely good people, they understood the manufacturing processes and they understood logistics". He explained the standing of the two units "In benchmarking either of the two, the company was seen as one of the top in these areas". But when the business redesign initiative was started it was identified that, in order to provide a supply chain that was going to support the customers and not the organisation, the company had to begin defining the supply chain from a customer view point rather than from the company out to the customer.

The interviewee also related the example of financial reporting: "Similarly when the company wanted to change the finance and reporting process the IT system was a blocker in the UK". He continued: "In this situation the Business Unit MD was told that he was in control but the HQ finance people knew the information about the businesses before the MD did". The company decided that "the only way to deal with that was to take the information out of the centrally IT system and switch it off". The interviewee emphasised that the business units were in control of their reengineering activities: "the change programme was driven from a business point of view where businesses were to be in control". In fact the "reduced the amount of information flow by 80% - quite drastic for a very much financially driven company".

During the change programme the company was restructured significantly. Previously the business was totally driven by the head quarters in London. "Now it is driven by businesses". The business units are market, product and country based. "The issue was how to put the power into businesses". The change programme had revealed that "when [the company] wanted to put their business unit processes in, people had no authority because the IT system kept the decisions back in the head quarters". The IT system was regarded as a "blocker to the organisational shift and needed to be changed very quickly". The company decided to go "for some quick wins" and reengineered their financial system very quickly in order to "have finance data up to

the point of decision making in businesses rather than reengineer the underneath of the businesses".

As a result of this restructuring and to the degree that the responsibility and authority changed" the role of information systems became a very different role than that of a traditional IT department. "The change team was conscious of the fact that they were not going to put IT systems in place which were going to stop them in the next round of evolution in the way they run the businesses. This required a culture shift".

When the Head of IS was appointed to oversee the change programme he refused to accept an IT driven redesign and demanded responsibility for the processes as well. "It was never really an IT job to the extent that the exercise was named Information Processing". The interviewee explained that "this was quite deliberate because [the company] aimed to put the IT decisions within the business and they did not want a separate IT department trying to understand the way the business works from afar. Hence the business issues and the IT issues in the business". This reflected the increasingly integrative role of ISps in reengineering programmes. The organisational IT strategy is now determined by a central team and each business unit is responsible for translating that in their individual business, "there is an overall IT strategy but run by business people".

The interviewee believed that the titles of initiatives help define the focus and objectives of a change programme. "The launch of a new supply chain process, deliberately called the CUSTOMER supply chain process helped to get people to think differently. Questions asked within this were:

- Why don't you build to order?

It was discovered that "logistics still thought that it took eight weeks to manufacture a machine; and manufacturing though that it took eight weeks to move anything around the country". The interviewee argued: "therefore, because they did not build to order they had to build a warehouse, building to what they thought the customer requirement was and not the actual customer requirement".

The next question was:

- Why do have separate logistics and manufacturing?"

The interviewee believed that "from a customer's point of view, they (logistics and manufacturing) are not different". "There were two directors involved in addressing this and both were at a senior executive level within the organisation, hence there had to be another director who tackled the issue. It was then decided that "the senior IS director should be responsible for assessing how to bring logistics and manufacturing processes together".

The change team then had the "task of understanding whether it was right to combine them as a cost centre and not as a profit centre in its own right...and so on".

Throughout this exercise the ISps played a role in working with the "businesses in order to help them understand and own the outcome. It is important to note that this was not an information driven activity. Information was crucial and was part of the activity, but it was the culture, the way the company want to run the business that was the driver".

One particular role which ISps assumed as part of a 'need to know' exercise, was "the task of educating businesses that the organisation can be run more efficiently on less information". The chief executive had agreed to this approach provided that any questions asked of a business unit MD could be answered within 24 hours. The interviewee was pleased to report that "the information system that was implemented could comply with that". The interviewee explained that "the fact that he [the CEO] mentioned 24 hours meant that there was a differentiation made between the normal reporting mechanism and the exceptional question handling issues that had a large impact on the financial reporting system. This type of concepts were drivers to change. This was the culture shift".

In looking to the future the interviewee repeated that the BPR initiative in this company had been part an continuous quality improvement effort and part of a business reengineering exercise. The change programme was continuing under the title of the 'breakthrough initiative'". Change is the norm as this company "is in a

type of business that is always moving, their markets are moving all the time and there are major new opportunities which means restructuring the organisation". He also mentioned that "businesses themselves are going through different rates of change i.e. the company has a retail business which was driven out of UK two years ago and now driven from the US".

In relation to the future role of ISps, the interviewee argued that "due to the fact that there is no constraints on the networking and the emergence of the open network architecture, it is now possible to align business processes and information processes much closer than in the past".

The interviewee believed that, from his experience in software engineering, a "key issue in any business environment is managing complexity - structure, analysis, simulation. Whereas now it is organisational complexity in the software engineering environment it was real-time complexity". He believed that "the technology that is available now, such as client-servers architecture, will be used to support the company's objectives and its management principles". The changing technology should be seen it terms of it business implication rather than the technology itself. "Client-server architecture is not an argument about mainframe versus other technologies its about how the company structures its information and now with open networking there is no longer the need to lock anything into physical addresses". As a result "the company does not have to compromise any longer when the alignment is made between the organisation and processes, which were compromised in the past". In this scenario the interviewee regards ISp as "individuals with specific knowledge of their business areas who are able to use information according to their needs".

The interviewee suggested that "such information and knowledge should be within the professional community". Furthermore, the "ability to provide the knowledge is the role of ISps". The role of IS managers is then regarded as "is opening up this issue and is enabling people to use their professional skills much more effectively" This may be described as "entering knowledge management, not just an information management issue any longer". The interviewee believed that ISp (as defined by this research) will be "moving into a knowledge era, which is not fully understood yet, driven initially by the group of specialists within the centre not least of all what used

to be the old information processing team. The interviewee defined knowledge as a combination of "information and experience". The company has recognised that in an increasingly competitive and global environment "the issue is how to share information and experience in an international business environment, thereby crossing the boundaries in different parts of the world". "IT can open up the infrastructure to enable users to move that [knowledge] around and have access to it from anywhere in the world". However, the concern is one of interpretation of local experiences in a global business environment. "The issue is how does one capture the experience in Europe and make that useful for an individual working in Tokyo?" Further, the interviewee reported that "the use of Intranet has significantly increased with a high number of users and needs to be orchestrated from a centre because it is still unknown how this knowledge is to be used within the company".

Overall the interviewee was optimistic about the future role of ISps, noting that "The IT world now understands much better the implications of what it does and systems can be designed which are flexible such that they can now respond to or enable the business changes which before they used to block".

He believed that the reengineering programme had helped the business units to become more aware of their own business activities and therefore be in a position to demand, from the Information Systems professionals, what they need to do their job. Moreover, he suggested that is now a greater appreciation of how the two, business and systems, professionals can work together to achieve the business goal which in this company is primarily customers focused.

In summary, the main points which emerged from comprehensive discussion with this key IS/user hybrid in Company D1 were:

The aims of the BPR initiative were to:

- Continue the quality programmes already in place;
- Align IS/IT with revised business processes;
- Undertake business re-engineering not just process reengineering;

The role of ISPs before BPR could be described as to support existing functional strategies. The change programme had revealed that existing systems were "blockers" to change and had therefore driven a different approach to the use of IT and the role of ISps, i.e.:

- Support role for business in change programme;
- Help with streamlining processes;
- Define processes from a customer's viewpoint, not from a business viewpoint;

The ongoing role was now seen as:

- Supporting the rapidly changing business;
- Internal communication become key concern between business and geography;
- Facilitating knowledge sharing and knowledge creation not just information sharing.

5.6 SUMMARY OF CASE STUDIES FINDINGS

Table 5.1 summarises the key points which emerged from the interviews with the seven participants representing the four case study companies.

	Company One (A1)	Company One (B1)	Company One (C1)	Company One (D1)
Nature of business	Express delivery service	Petro-chemicals	Financial Services	Global blue chip
Aim of BPR	Integration of customer service; information management and sharing.	To streamline and integrate disparate business units.	Desire to cut costs dramatically, as type of business is very cost competitive.	Business reengineering Realign systems with the business processes.
Role of ISp *before* BPR	Responsible for disparate back-office systems.	No policy and standards; Users expecting ISp to support these disparate systems.	Short term technology focus.	Fragmented functional IT strategies in place.
Role of ISp *during* BPR	Adopt role as "central striker" in process redesign.	Helping to identify where processes could be simplified. Introducing standards.	Responsible for designing and developing systems in response to the needs of the business.	Support role for business in change programme; Help with streamlining processes
Role of ISp *after* BPR	Supporting existing systems and developing new ones.	Disparate business units enabled to access and process information using centralised systems.	Sharing and helping in problem identification; Proposing alternative solutions; Enhanced project management role.	Role of IS increasingly focused on the business; Business support function.
Anticipated *future* role of ISp	Work more closely with the users as part of "Change Management Teams".	Due to the increasing numbers of workers requiring remote access to enable them to work in flexible manner, the future ISp will have to ensure support for such working environments.	Work towards project targets; Setting project expectations of business professionals.	Must pay attention to needs of the internal process 'customers'; Development of knowledge sharing mechanisms.

Table 5.1 - Summary Case Study Findings

These Case Studies, being more in-depth and interactive than the questionnaire and interview stages of the research, have further increased the understanding of the role of the ISp before, during and after BPR programmes, and have given an indication as to the anticipated future role of the ISp.

In addition they have confirmed and underlined the findings of the original questionnaires and the subsequent follow-up interviews outlined and discussed in Chapters 3 and 4 respectively.

The questionnaire responses indicated that the role of the ISp prior to BPR was that of a support function, managing the IT requirements of the organisation, whereas during BPR, there was a need for ISps to gain a greater understanding the information requirements of the organisation and its new processes. The ISp role was to be involved at the start of the BPR programme, whilst not leading or owning it.

The follow-up interviews pointed to the possibility of the 'hybrid' ISp, a professional being business-aware and IT-literate, and in some cases acting as a catalyst for future change.

The Case Studies have confirmed that the pre-BPR role of the ISp in the Case Study organisations was a technical support function. This matured during BPR, to a role that was key in helping to identify processes for redesign and helping to redesign them with the capabilities of IT in mind.

These Case Studies have further indicated that subsequent to BPR organisations perceive the need for a much more business-driven role for the ISp, adding value to the organisation and increasing the benefits of process redesign. In some cases the ISp have been very much involved in change teams, liasing with other business professionals to drive requirements and to set expectations.

This development of the role of the ISp to add value to the organisation is discussed in the next chapter. A set of models have been created to illustrate how organisations considering change programmes might adopt best practice and successfully development the role on the basis of the experience of the organisations involved in this research.

Chapter Six

Conclusions, a Reference Framework and Future Research Directions

6.1 CHAPTER SUMMARY

As was stated at the beginning of this thesis, the specific aim of the research was to investigate the role of Information Specialist (ISp) as a change agent of Business Process Reengineering (BPR) and to test the proposition that the role of the ISp in BPR initiatives and resultant process oriented organisations is different from that of the traditional IT/IS technical specialist. In particular, evidence has been sought to test the theory that in process oriented organisations ISps play a wider, more pro-active and more business oriented role than previously.

The research has provided detailed empirical investigations into the actual experiences of organisations that have undertaken BPR initiatives. Having presented the findings of the research in detail in Chapters 3, 4, and 5, this chapter draws together the key findings. It also suggests a reference framework which companies might use in considering their future use of ISps. Finally a postscript details the limitations of the work, suggests the possibility of extending the work in the light of recent developments, particularly the emergence og new e-Business models, and draws final conclusions from the work.

6.2 PRIMARY FINDINGS ON THE ROLE OF ISPs IN BPR

In each of the various stages of this research the companies involved have provided information regarding their BPR programmes in a number of areas:

- Aim of BPR – what were the key reasons for considering a BPR programme?
- Role of ISp before BPR – what was the perceived role of the ISp before the programme commenced?
- Role of ISp during BPR – what was the role of the ISp during the BPR programme?
- Role of ISp after BPR - what is the role of the ISp following the BPR programme?
- Anticipated future role of ISp – what is the anticipated role of the ISp going forward?

The tables and figures which follow summarise and depict the key findings from the responses:

6.2.1 - The Aims of BPR

Questionnaire data findings	Follow-up Interviews data findings	Case Study data findings
• The majority of respondents involved in BPR were looking for organisation-wide process improvement. • The vast majority are aiming for substantial performance improvement. • Improvements in work processes and information flows are important to all respondents, regardless of industry sector.	• Specific aims differed somewhat based on the market pressures found in each industry sector. • Despite the differences in the various industries and the subsequent differences in the aims that various organisations have for their BPR initiatives, BPR is still the mechanism by which these improvements are being searched for.	• Integration of customer service, information management and sharing. • To streamline and integrate disparate business units. • Desire to cut costs dramatically, as type of business is very cost competitive. • Realign IT with the business. • Align IS with the revised processes.

Table 6.1 Summary of the findings - Aim of BPR

Figures 6.1, 6.2 and 6.3 below have been devised to indicate the necessary organisation-wide developments in communication, collaboration and information sharing found within the organisations undertaking BPR change programmes. Information management is clearly seen as a key determinant of successful BPR. Even though the BPR programmes are business-driven initiatives effective use of IT to facilitate the developing role of information sharing and inter-function communication is seen as vital.

BPR is undertaken to improve internal communication and to enable companies to get closer to the customer:

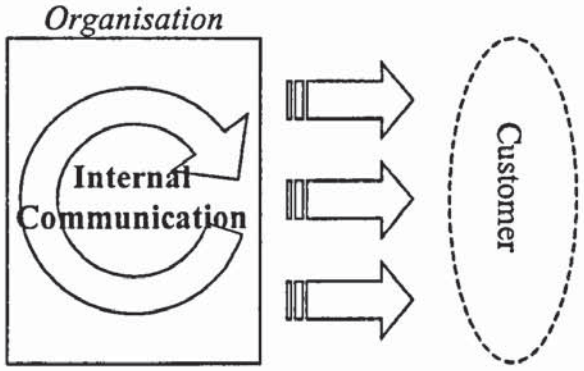

Fig 6.1 Improved Communication

BPR programmes should be organisation-wide and extensive enough to make a real difference:

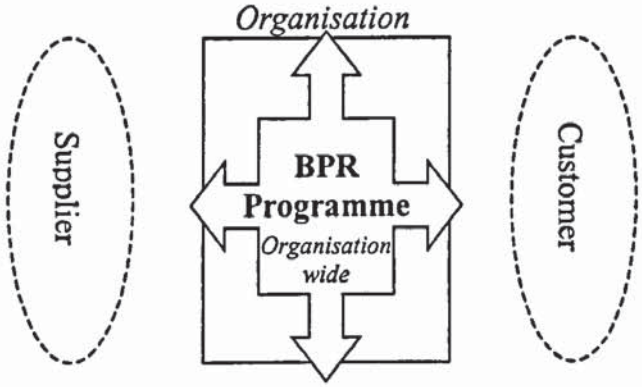

Figure 6.2 Organisation-Wide BPR

BPR is a business-driven initiative, not a purely IT-driven exercise, even in IT-dependant organisations:

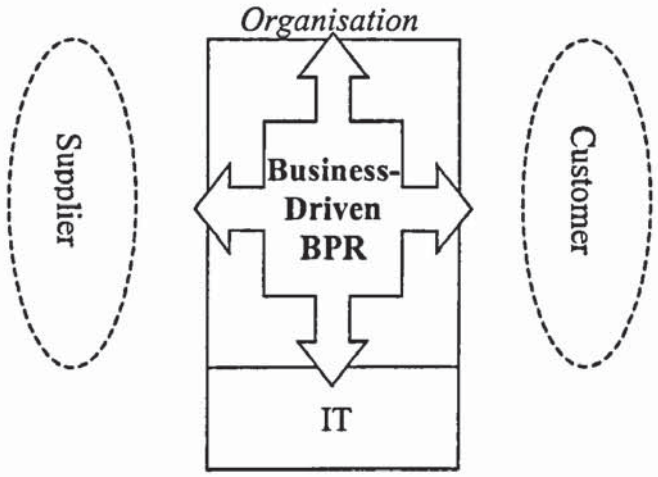

Figure 6.3 Business-Driven BPR

The majority of respondents involved in BPR, regardless of industry sector, were looking for organisation-wide and substantial process improvement, particularly in work processes and information flows. Key aims were for the integration and streamlining of business units, with improved information sharing and realignment of information technology with the business. Cost savings were seen as key deliverables, along with these process and information sharing improvements.

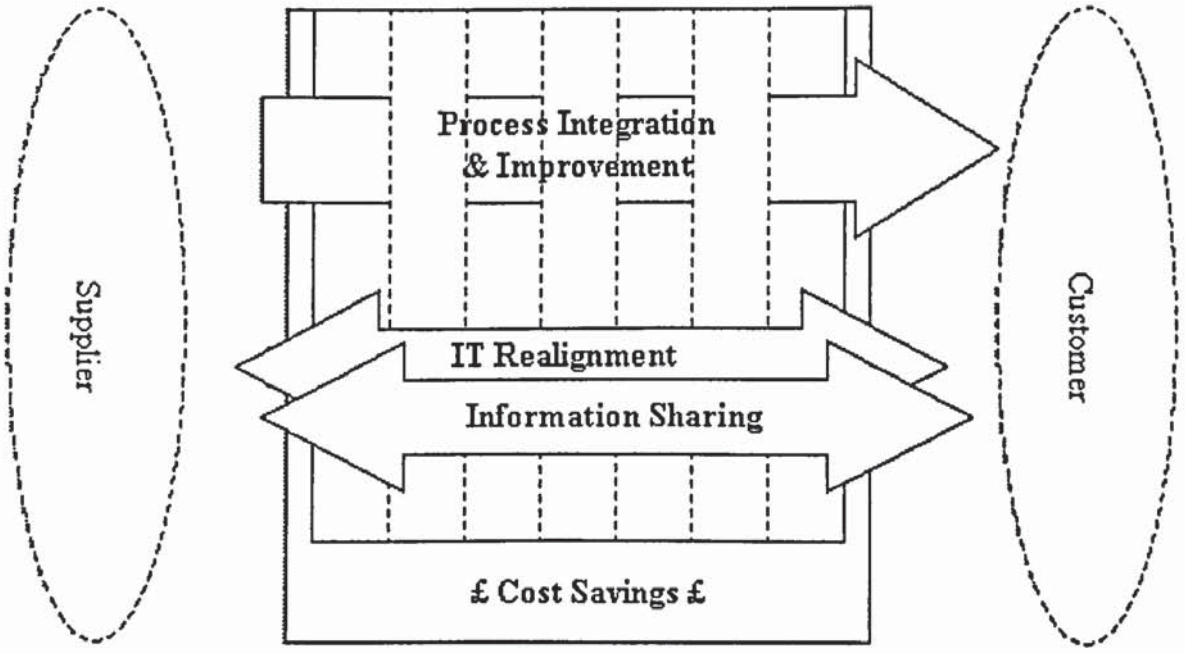

Figure 6.4 Organisation-Wide and Customer Focused BPR

Overall Aims of BPR: Organisation wide process improvement and enhanced customer focus, improved information sharing and realigned IT support.

6.2.2 - The Role of the ISps Before BPR

Questionnaire data findings	Follow-up Interviews data findings	Case Study data findings
• Functional Management plays predominant role in setting up and ownership of IS/IT programmes. • ISps react in terms of what can be done.	• Consistent message across all of the industry sectors is that the role of the ISp has been to manage and support back-office systems. • These systems are often disparate and functionally divided. • The ISps in Group A are described as being technology focused, and in Groups B and C there is also evidence of ISps dictating to the business what they could do, rather than the business making requests to the ISps. • One company using external service providers to assist in using IT for competitive advantage. • Some companies beginning to perceive some of the change issues that ISps could support. • Regardless of industry, most of the organisations in the interview sample were using their ISps as support for automated back-office functions. • Speeding up processes rather than reengineering them.	• Responsible for disparate back-office systems. • No policy or standards. • Users expecting ISp to support these disparate systems. • Short term technology focus. • Functional IT strategies in place, but little corporate vision.

Table 6.2 Summary of the findings – Role of ISps before BPR

Before the commencement of BPR programmes ISps were predominantly technology-focused, concentrating on managing and supporting current business and operational activities. There was no attempt to reengineer work processes, only to make them faster, with a short-term technology view. IT strategies were functional, rather than organisation-wide, leading to islands of automation and reduced opportunities for information sharing.

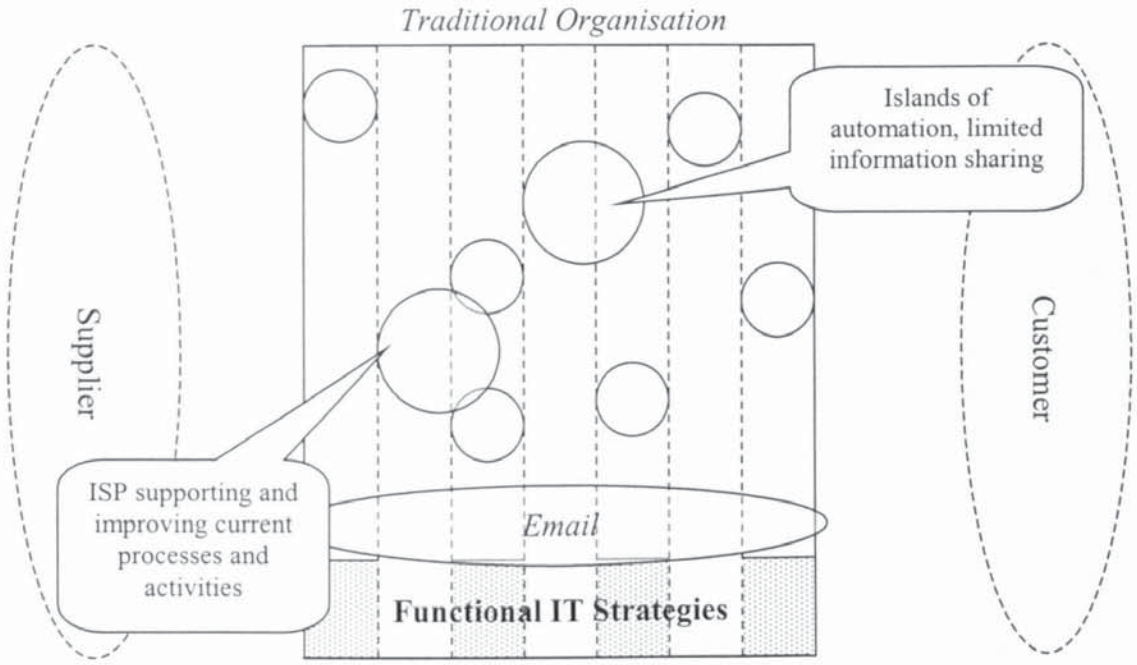

Figure 6.5 Role of ISp Before BPR

6.2.3 - The Role of the ISp During BPR

Questionnaire data findings	Follow-up Interviews data findings	Case Study data findings
• Substantial number of respondents felt that the IS team should be involved from the start of the BPR initiatives. • Information requirements mainly evaluated for process dimension of the business, followed by 'functions' and then the organisation itself. • The IT solutions being used, or planned to be used, by the respondents indicate holistic solutions rather than localised ones, indicating the need for information sharing across organisations as they undertake and complete their BPR programmes.	• Main message is that in BPR the ISp much more involved in working with the business units. • "Hybrid environment" created. • ISps working closely with the business. • Technical understanding is used to help integrate previously disparate business units and create new processes or redesign and streamline existing processes. • ISp role is to support the change program, and they are seen as a catalyst and change agent by one organisation.	• "Central striker", helping to identify where processes could be simplified. • Responsible for designing and developing systems in response to the needs of the business. • Support role for business in change programme. • Help with streamlining processes.

Table 6.3 Summary of the findings – Role of ISp during BPR

Figure 6.6 indicates that the BPR programme forces the business and IT people to work more closely together and Figure 6.7 takes this further by pointing out that the ISp must

develop a greater focus on the needs of the business. This enables the ISp to better understand the key requirements of the business, and to communicate this to the IT function, enabling them in turn to add increased value by addressing these key requirements. The need for the business- and IT-aware ISp is clear by the nature of this relationship.` ISps have had to become more business-focused, in order to understand the business requirements and to ensure that IT adds value.

Figures 6.8 and 6.9 explicitly show how the role of the ISp during BPR initiatives is key, and that the role's involvement in the early stages of the programme is vital.

The final model in this section, Figure 6.10, shows the maturing of relationship between the business and the ISp during and post BPR. The business increasingly approaches the ISp with their business problems, and the ISp in turn provides integrated solutions to these business problems rather than the old way of providing solutions to disparate departments without a holistic and business-first focus.

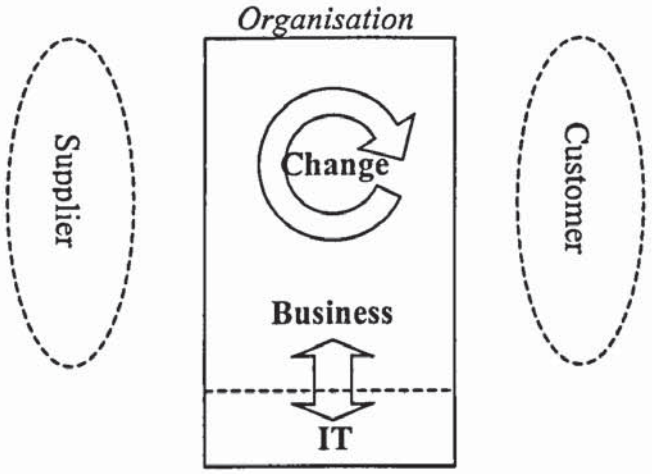

Figure 6.6 Bringing IT and Business Professionals Closer

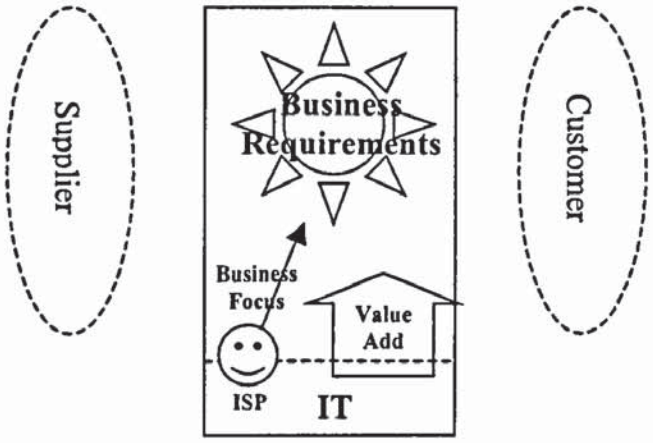

Figure 6.7 ISps have Become More Business Focused

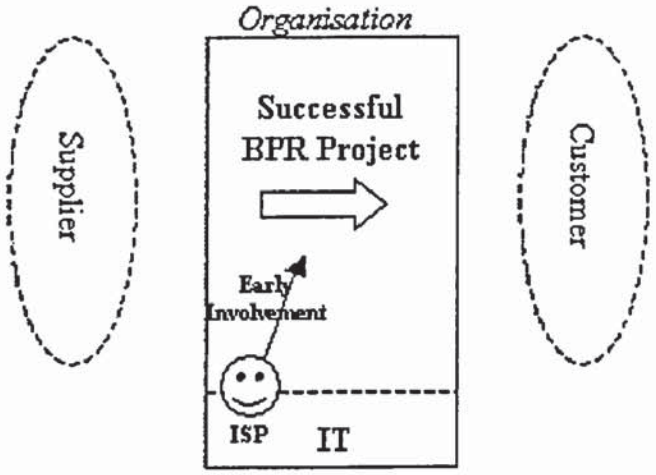

Figure 6.8 Importance of early ISp involvement - the early involvement of ISps in BPR initiatives is important for success-first-time projects

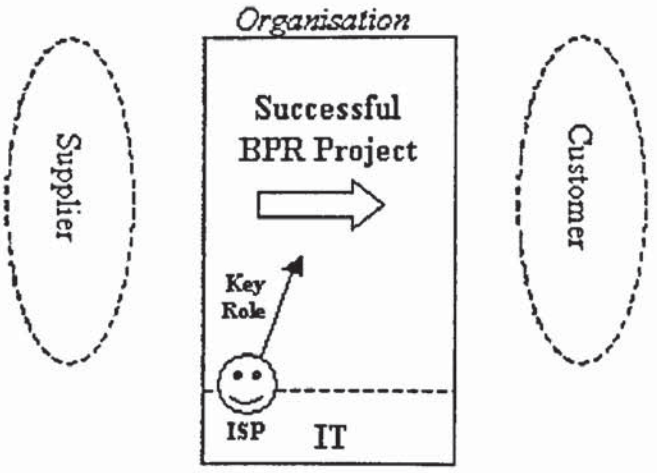

Figure 6.9 ISp Playing a Key Role in Successful BPR Projects

Business units increasingly approach the ISp with problems rather than solutions, one explanation being that the business units are more confident that the ISp will understand problem and provide an effective solution.

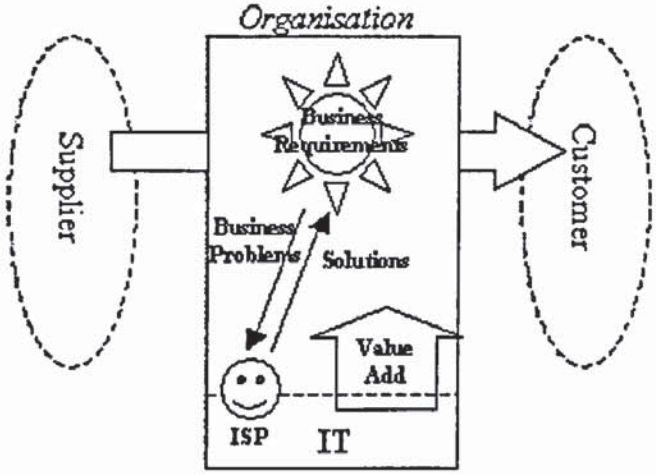

Figure 6.10 ISp Adding Value to the Business

In summary, during the BPR programmes there was a clear requirement for the role of the ISp to mature into one that was more involved in the business units being supported. More organisation-wide views were taken, acting more 'holistically', rather than the more functional myopia of the past. In some organisations the role developed into one of proactive change agent and helping to identify processes that could be simplified. The information requirements of these processes needed enhanced IT solutions to support them, and the ISp's understanding of the business and new processes was key in this process reengineering.

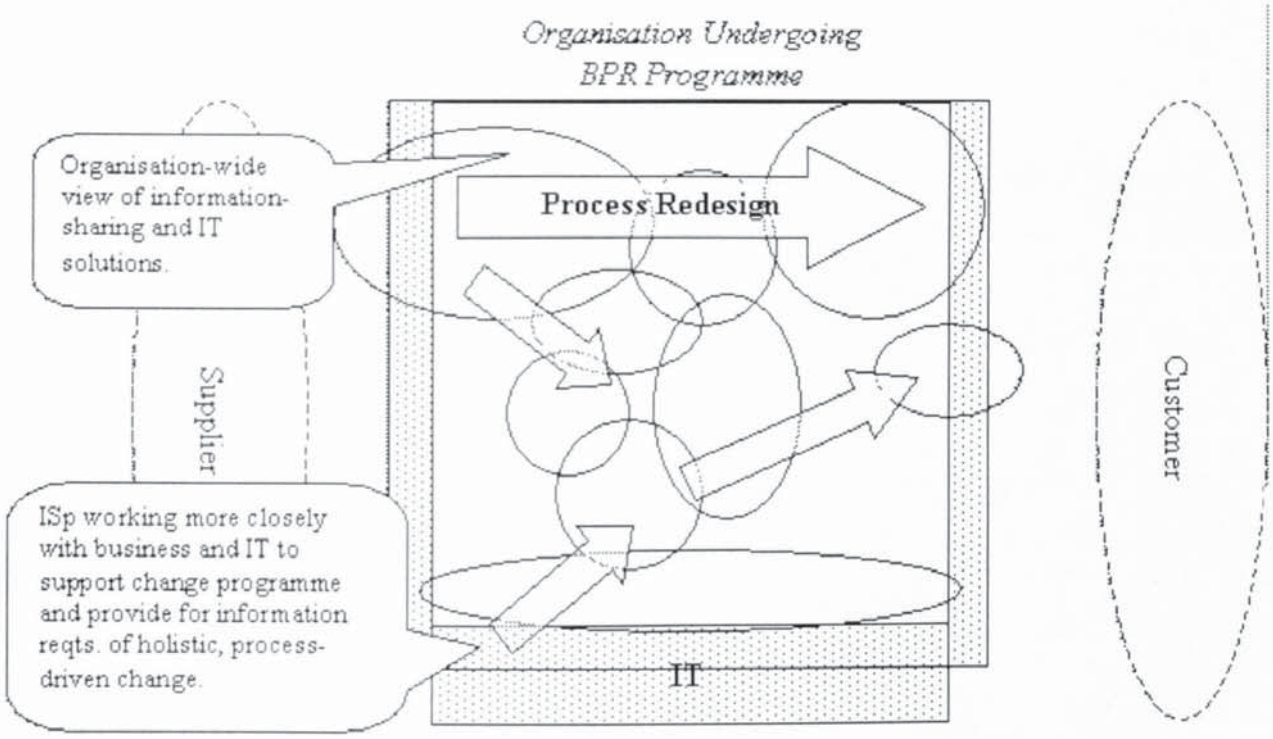

Figure 6.11 Overall Role of ISp during BPR:
Business focused, technology knowledgeable change agent.

6.2.4 - The Role of the ISps After BPR

Questionnaire data findings	Follow-up Interviews data findings	Case Study data findings
• Surprisingly, a number of respondents have indicated ongoing deficiencies in links between the IS and business strategies. • However, as expected, where there is a link, IT/IS professionals are indicated as playing a primary role in this. • A high percentage of respondents do indicate that the IS strategy is updated in line with the corporate strategy.	• Variety of suggestions from all sectors, indicating ongoing uncertainty. • The main message, regardless of sector, is one of IT being much more focused on the needs of the business. • Business is now driving what the ISp provides, not other way around. • ISp needs to be more business aware. • 'Gap' between IT and the business is being bridged. • Multi-functional teams are being set up to focus on the business requirements not just on IT capabilities. • Information management issues now being addressed. • ISps trying to provide for the new information requirements of the new cross-functional processes. • Steering committees and strategy groups are being set up, looking at future of the organisation's IT necessary to support changing needs of the business with ever increasing advances in technology.	• Supporting existing systems and developing new ones. • Disparate business units enabled to access and process information using centralised systems . • Sharing and helping in problem identification. • Proposing alternative solutions. • Role of IS increasingly focused on the business. • Business support function, focused on Information and Knowledge Management.

Table 6.4 Summary of the findings – Role of ISp after BPR

Figure 6.12 has been devised to show how the role of the ISp has also become extra-organisational, using IT in an innovative fashion to enable effective and pro-active information management and process innovation. The information requirements of processes that cross external organisational boundaries to reach suppliers, partners and customers must now be considered in the new era of e-business and internet communication and transaction. The ISp must be able to communicate the requirements of the business, in it's new wider sense, to ensure the IT department can meet the increasing demands of the business.

Having seen that the role of the ISp needed to be widened and enhanced during BPR programmes, the organisations surveyed found that the ISp role now needed to be much more business-aware than previously. The more complex information requirements of cross-functional processes required a wider view from the ISp than the more parochial view of the past. Understanding of the needs of the business became key, providing for these needs with IS solutions that crossed organisational boundaries. The value of

information management and information sharing became more important, and the role of the ISp became more focused one providing for these. Closer integration with the business became key.

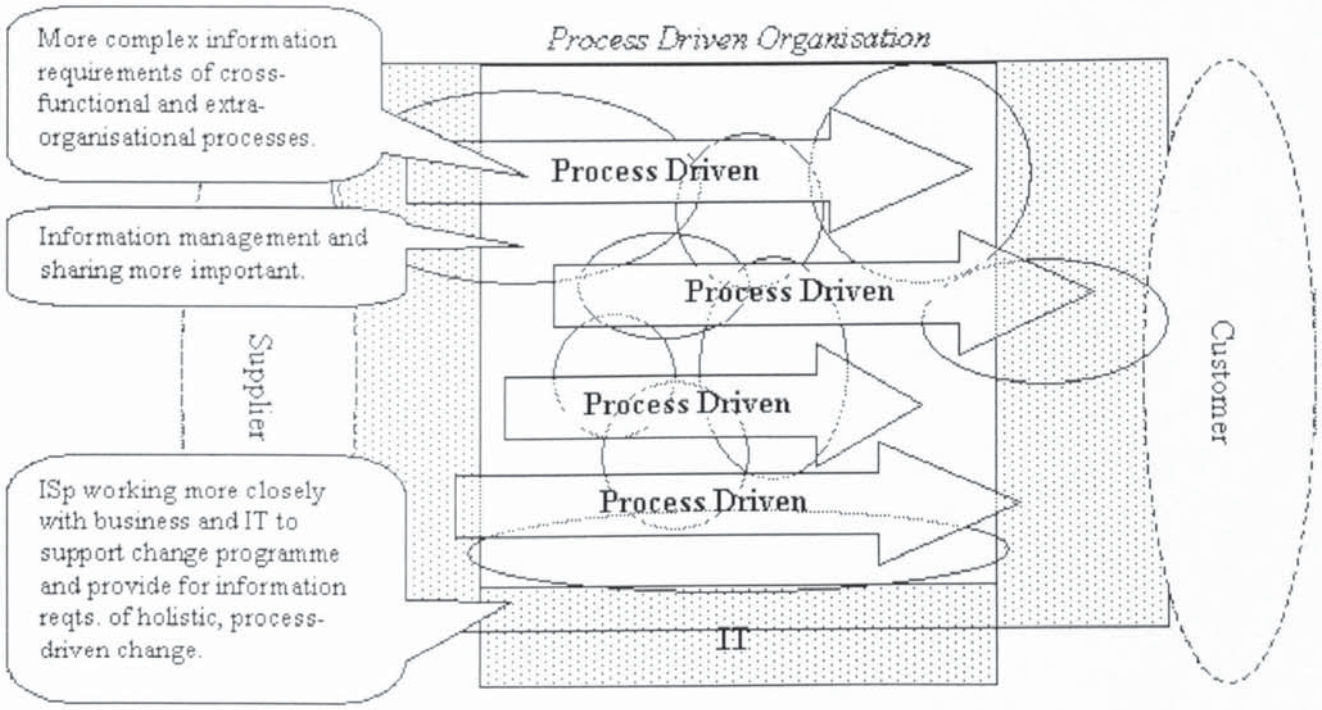

Figure 6.12 Role of ISp after BPR

6.2.5 - Anticipated Future Role of the ISp

Questionnaire data findings	Follow-up Interviews data findings	Case Study data findings
• No consensus • Little evidence of forward thinking	• Variety of responses were received. • Most consistent message across all industry sectors is future role of the ISp following BPR programmes will be to be even more integrated with the business. • 'Hybrids' will be sought for this role in future. • Business-led change programmes will be aided by the ISp. • ISp will not only support change, but drive it as a 'catalyst' for change, using IT to add value to the business.	• Work more closely with the business and the traditional IT department. • Due to the increasing numbers of workers requiring remote access to enable them to work in flexible manner, the future ISp will have to ensure support for such working environments . • Work towards project targets. • Setting project expectations of business professionals. • Must pay attention to needs of the internal process, the 'customers'. • Outsourcing increasing, but only part of the activity. • External links increasing in importance.

Table 6.5 Summary of the findings – Anticipated Future Role of ISp

When asked about the anticipated future role of the ISp in the organisations surveyed, a variety of responses were received, but the predominant view was that the ISp needed to be even more integrated with the business. They will act between the business and those whose role is more akin to the traditional IT department.

Change programmes will be business-led, and increasingly supported by a 'hybrid' professional, who is technology- and IS-aware, whilst also understanding the needs and expectations of the business. In addition to supporting change programmes such as BPR, those organisations surveyed suggested that the ISp will in fact become a 'catalyst' for change, using IT to add value to the business. The role will be more 'customer-driven', paying attention to the needs of the processes and those they touch. Some organisations believe this will also include the needs of the new mobile work force, and involvement in outsourcing programmes.

Figure 6.13 illustrates that the role of the ISp can be enhanced to become a change agent within and after BPR efforts. In order for organisations to realise the optimum value from their change programmes, they must ensure that they derive the greatest value from the

ISp. The models already discussed suggest that the early and cross-functional/business involvement of the ISp provides the greatest benefit to the organisation's increasing information and communication requirements. Therefore an organisation can fully utilise the capabilities of the 'hybrid' ISp by ensuring these models are reflected on, and that the role of the ISp is developed into the top-right section of the 9 box model of Figure 6.15. By approaching the extra-organisational as well as organisational issues from a strategic corporate view, and use of IT from an innovative information management standpoint the ISp will facilitate considerably more successful BPR programmes and be more effective thereafter.

It is suggested that these models together therefore form a framework on the effective use of the ISp role within an organisation undertaking BPR change programmes. They provide a roadmap for these organisations to begin their BPR or organisational transformational programmes with a clearer picture of how the role of the ISp should be used to best effect.

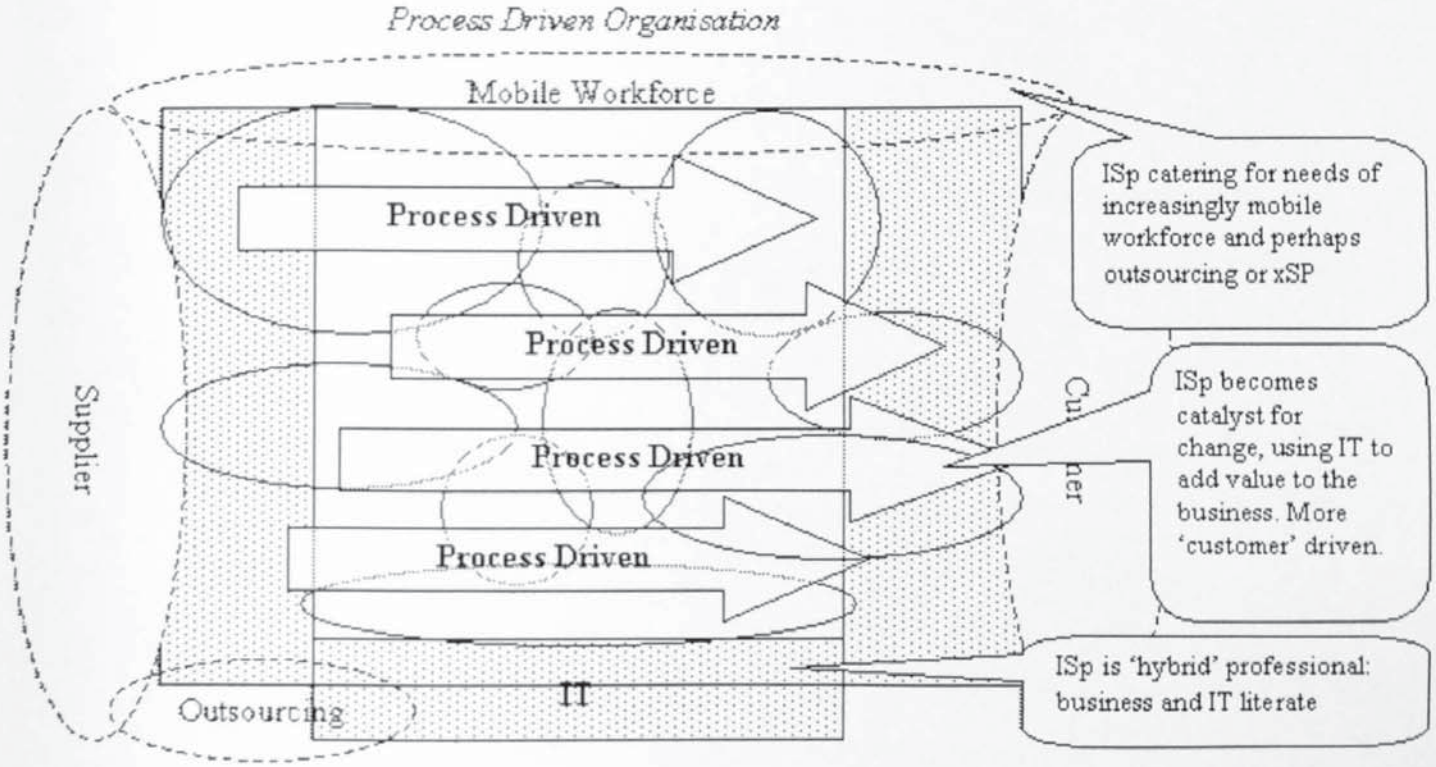

Figure 6.13 Anticipated Future Role of ISp

6.3 EMPIRICAL SUPPORT FOR THE RESEARCH PROPOSITION

This research has investigated the role of ISps at various stages of organisations' attempts to change their focus from a functional to a process-oriented orientation. It has specifically tested the investigating conjecture that as organisations become more process oriented the role of ISps will change and will become less technical and more business focused.

It is the author's contention that the research has produced substantial empirical evidence to support this proposition.

Overall, the fieldwork has revealed the diverse nature of organisations undertaking BPR. The organisations studied were from different industrial sectors, each experiencing unique market and competitive forces, and yet all have used BPR to enable them to achieve their goals. It has also been shown that, despite the range of the objectives for BPR, the role of the ISp in these organisations has seen similar developments throughout the lifecycle of the BPR initiatives.

Prior to BPR, the ISp was predominantly involved in back office automation and was far removed from the business. During the BPR programme the ISp's role has become more of an integral part of the business, communicating and collaborating with business divisions to increase the value-add of IT.

The ISp has been found to be an essential participant in BPR projects. The organisation must be made aware of the capabilities of technology as an enabler of new process designs, and it is essential that an understanding of current IT is represented within the BPR team. Once the goals of the BPR programme have been determined, the project cannot be considered in isolation from the information systems infrastructure or from potential IT solutions.

This new role of the ISp, to be more aligned with the business and to become far more customer focused. This shows how the new role encompasses not just the primary activities, but the support activities of an organisation as well. Information management across all functions has been shown by this research to be a key deliverable of the IS infrastructure during and after BPR, as the traditionally isolated and insular processes within the organisations become cross-functional and open. Information sharing is essential. The role of the ISp has thus evolved to encapsulate the business needs of the organisation, and become a change agent, enabling this new way of working with the dual focus of information technology and the needs of the business.

It is now appropriate to consider the impacts of these findings in two ways. Firstly, the extent to which they are consistent with or contradictory of previous published work is of interest, especially to business academics. Secondly, the relevance of the findings to practitioners in the future recruitment and deployment of ISps is a matter worthy of comment.

6.4 RELATIONSHIP TO PREVIOUSLY PUBLISHED WORK

In Chapter 1 the 'Literature Review' detailed the findings of previously undertaken research in the general domain of BPR/IT/IS relationships. The debate was more than a decade old at the start of this research, but had reached no general consensus on whether IT should be regarded primarily as an enabler of BPR, or conversely whether developments in IT are to be numbered amongst the main drivers of process oriented change. The results of the present research contribute to this debate, in that they reflect the views and experiences of a variety of real world BPR exponents.

The conclusions section of this research (above and as modelled in Figure 6.3) tends to indicate that almost all participants initially supported the contention of Davenport (1993) and Hagel et al (1993) that a BPR project should not be treated as an IT project, nor should IT drive BPR initiatives.

Galliers (1994) also adopted with this stance, suggesting that IT/IS should be "considered but not placed centre stage of any BPR effort". Macdonald's 1991 model (Figure 1.5) examining the role that IT can play in what he called the 'Strategy Alignment Process' and Benjamin and Levinson's 1993 work, again emphasising the role of IT/IS not as the instigator of change itself but rather as responding to the need for change, would have found support from almost all of the participants as they began the change initiatives. These practitioners would also support the contention of Kallio et al (1999) and Macredie et al (1999) that appropriate information technology deployment is a key ingredient of BPR, but that it cannot in itself guarantee successful implementations of BPR.

Certainly this research has found that IT/IS professionals rarely took the lead initiating BPR programmes. The participants were strongly of the opinion that change must be consider in context of business issues. Figures 6.1 – 6.3 above have shown how the organisations surveyed focused on business-driven BPR.

Other authors, however, particularly Rockart and Short (1991) and Davenport and Short (1990), as discussed in Chapter 1, have postulated that IT/IS has a potentially more active role to play in BPR and have explored the way that developments in IT can drive change in competitive organisations. They have suggested that IT/IS related changes have acted as a catalyst for the development of BPR programmes, which have in turn acted as catalysts for the enhanced use of IT i.e. that a recursive relationship might exist between IT and BPR. Robson (1994) also discussed this, finding that developments in IT have sometimes been responsible for driving change in competitive organisations. Davenport and Short (1990), Hammer and Champy (1993), Talwar (1993) and Broadbent et al (1999) all found that the capabilities of IT could be used to drive process redesign. Furthermore, Peppard et al (1995) have suggested that "the potential of IT to transform business is not in question; it is how to unlock that potential that is the question and BPR seems to be providing one answer."

In the light of these suggestions it is particularly interesting to note that. As shown in Figures 6.6 - 6.10, many of the interviewees have described how they brought together IT and business issues as their BPR progressed. They are also strong proponents, with hindsight. of the early involvement the ISp as a key to successful BPR and to ensuring that IT adds value within the change initiative.

This argument was further validated in the organisations surveyed when exploring the developing role of the ISp during and after BPR, and also the expected future role of the ISp. Figures 6.11, 6.12 and in particular 6.13, depict the evolution of the role of the ISp, increasingly catering for the more holistic requirements of the business, with its ider-reaching information needs and subsequently more complex and broader IT solutions.

In addition, post-BPR the ISp's role as a business-aware and IT-literate 'hybrid' emerged as a strong theme in the research. The future ISps needs to cater for the more complex information requirements of cross-functional and extra-organisational processes. The organisation's surveyed postulated that the ISps role will develop still further, suggesting the ISp will become a catalyst for change, using IT to add more value to a more customer-focused business. The suggestion was also that increasingly mobile workforces and dependency on outsourced operations or the services of ISPs would enable the organisation to focus on its core business.

In Chapter 1 the future role, if any, of the IT department as an organisational entity was also discussed, and the research of Bluestein and Hill (1993), Douglas (1993), Sykes (1995) and Earl and Skyrme (1992) all indicated that IT department needs to increasingly focus on the requirements of business if it is to survive. The finding of this research agree, and the organisations surveyed suggested that the ISp must work more closely with business and IT to support the change programme. Thus the developing role of the ISp as already discussed will increasingly be required to understand the needs of the business and the capabilities of IT. Thus the often mentioned role of the "hybrid" professional, who is both business and IT literate, again comes to the fore. Moad (1993) and Edwards

et al (1995) suggest that the IT function itself will need to be modified in order to fulfil this new value-adding role, or the organisation may well be replaced by more nimble structures, or better organised outside suppliers. Whether IS professionals will still be grouped together in an 'IT' department, or whether they will be dispersed throughout the business functions or processes is thus far from clear. In the responses to this research there is evidence of both approaches being adopted by different organisations, but as yet no evidence as to which will prove more effective.

Whatever the future ISp is called, the role will be the same: to add value to the business through IT, and hence an understanding of the key and fundamental needs of the business is increasingly paramount. Measuring this added value will be complex (Parker et al (1998), Willcocks at al (1997), Ciborra and Andreu (1998)), and the movement away from technical implementation to more business-driven IT projects (Brett 1995) will again place new demands on ISp. These authors suggest that ISps will more and more need to understand and communicate the increased value to be gained from the deployment of IT. This correlates with the findings of this research as depicted in Figures 6.12 and 6.13.

Finally, might an organisation's incumbent IT systems and ISps act as an inhibitor to a BPR programme? This was the possibility raised by Venkatraman (1991) and Edwards et al (1995). Earl and Khan (1994) similarly commented that incompatible IT structures within an organisation might inhibit BPR. In response to the current research a number of participants confirmed that their legacy systems were a major inhibitor to adopting a process orientation. Some also identified the attitudes of IS staff as being a significant inhibitor of change. The response to this latter issue was usually to bring in outside consultants and/or downsize the internal IS/IT department. In other cases, however, the issue was addressed by redefining and realigning the ISps responsibilities, such that they could play a pro-active role in driving cross-functional change. Figure 6.11 develops the discussion on the evolving role of the ISp during BPR already started in Figure 6.5, and confirms that it was possible in the majority of the organisations surveyed to adopt an

organisation-wide view of information sharing and to implement appropriate cross-functional systems using the existing staff.

Interpreting the previous literature in the light of the current research, the author believes that there is evidence to suggest that most progressive companies have come to realise the dangers of using ISps in purely reactive, technically oriented, functional roles. Furthermore they have realised the potential benefits of using their ISps as pro-active contributors to the solution of developing cross-functional processes rather than regarding as part of the problem and distinct from the solution.

6.5 PRACTICAL IMPLICATIONS - CHANGING ROLES AND CHANGING SKILLS REQUIREMENTS – A FRAMEWORK FOR UNDERSTANDING AND ACTION

Given the findings of this work in relation to significant and ongoing changes to the role of ISps, it seems likely that in practical terms a new generation of professionals is needed to help adopt appropriate technology from a business perspective. It also seems clear from the "Anticipated future Role of ISps" responses that no clear framework exists within which professionals can address these issues.

To explore the evolution of the ISp's role and sphere of influence further, the following diagram (Fig. 6.14) has been devised to depict the changing role of the ISp as a catalyst for change throughout the BPR lifecycle. This is shown in relation to the development of the role of other professionals as suggested by the participants in this research. The diagram is not based on statistical measurement, rather it is based on indicators of the evolving role of the ISp.

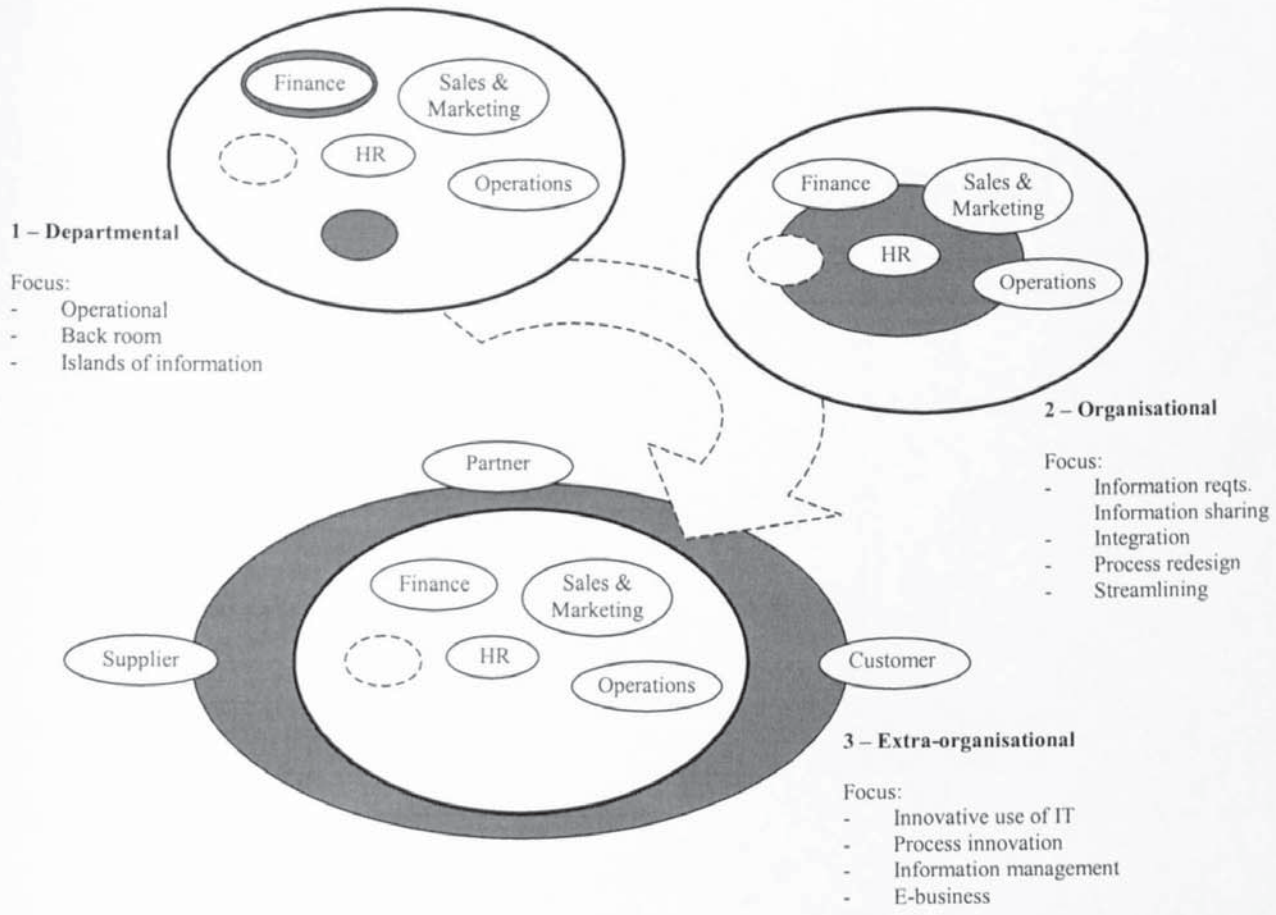

Figure 6.14 Evolving role and influence of the ISp

The first element shows the disparate and isolated ISp, which was the case prior to BPR across all the industries surveyed. Focus is on operational and back room concerns, and disparate systems, islands of information and localised issues are prevalent.

Element two of the model shows how this role has been found by this research to become cross-functional during-/post-BPR, as the creation of the new business models require the ISp to support and drive the change, necessitating communication with all aspects of the business. Processes are redesigned and streamlined, and systems integration and information sharing becomes an integral part of the ISp role.

The third element reflects how the role of the ISp has evolved further in recent years with the advent of electronic commerce and the rise of inter-company IT-based communications. The continuing requirement for the ISp post-BPR to communicate across all functions within an organisation is further reinforced by the need to strengthen communication with external entities essential to the e-business organisation. Organisations depend on the innovative application of IT to remain competitive whilst remaining responsive to further change.

This model has been further developed to create the following figure (Fig 6.15) which illustrates the role of ISp as Change Agent, and can be used as a foundation for assessing the appropriate role of the ISp for any organisation attempting major change programmes.

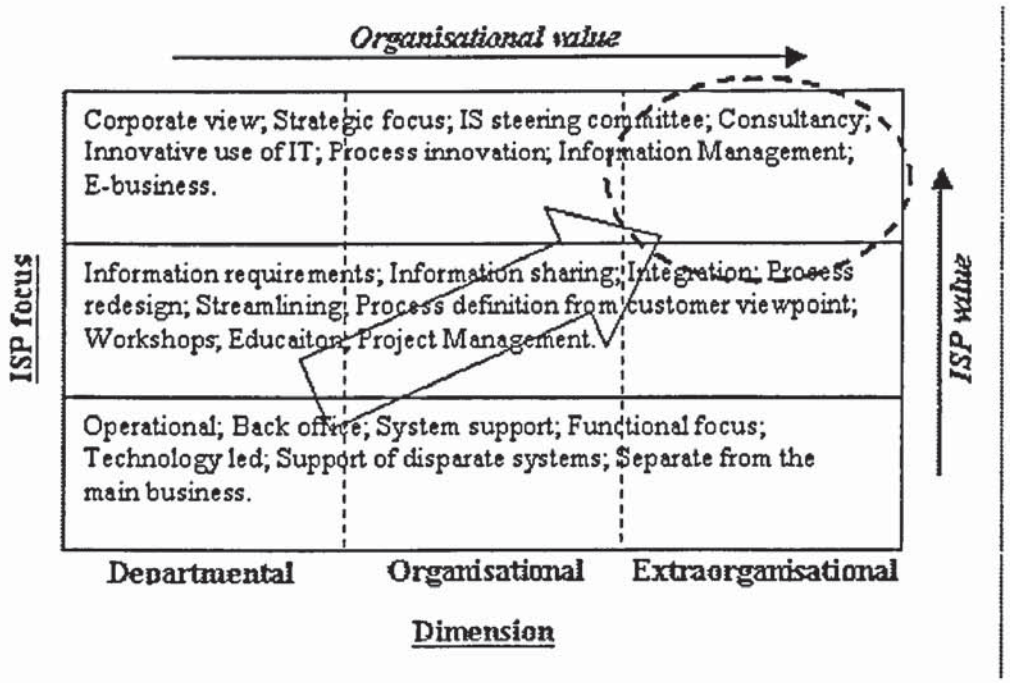

Figure 6.15 Potential Role of ISp as Change Agent

The role of the ISp in the organisations studied in this research has indicated that ISps have the potential to become key change agents, not only in their BPR programmes and in the shorter term but also in the long term strategic use of information technology.

As this model shows, the departmental and local issues originally the focus of the ISps have expanded to encompass organisational and extra-organisational issues. The further to the right of the model, the wider dimension of the ISp's role, and subsequently the more value to the organisation. This would be reflected in more process innovation, greater streamlining and efficiencies, organisation-wide information sharing and information management, and finally greater returns from the information technology investment.

In addition, the further developed the focus of the ISp role, the greater the value that the ISp can add to BPR change programmes. From a back office, supporting role, the ISp's role develops into one of support for the BPR initiative, focusing on process redesign, and the information requirements of all elements of the business.

The role grows beyond this to add substantially more value by focusing on innovation and the strategic, wider issues of the business.

Clearly the further towards the top-right of the matrix an organisation can place their ISps, the greater value they can derive from the ISp and from their IT investments.

As was stated above, there is no recognised model or framework in place to guide organisations in the most effective use of the ISps and the key skills that the ISp possess. (A definition of a framework in the context of this research is a model (a "road map") which is based on the best practices and lessons learnt from the organisations reviewed. It can then be used as a guide to enable following organisations to achieve success; it is a set of pointers for best practices based on real world examples). It is the author's suggestion that the models depicting the evolution of the role of the ISp during and post BPR in Figures 6.11, 6.12 and 6.13 already discussed above, and the models in Figures 6.14 and 6.15 can be used together to create such a framework. This framework for the role of the ISp in and beyond BPR programmes would aid in success-first-time BPR projects.

Organisations undertaking fundamental change programmes can use the framework, based on the experiences of the companies investigated, to ensure better and more effective use of their ISps and hence IT resources. In addition this will help to ensure the correct focus within future BPR projects, as organisations may be unsure as to the importance of the role of IT or the role of the ISp. The framework provides, from real-life examples, a road map for the use of ISps that can improve change project success rates, hopefully leading to fewer costly mistakes by learning from the experience of others who are further through the evolutionary path of Figures 6.11-6.13 and in 6.14 and are nearer to the top right hand corner of Figure 6.15.

The relevance of this research for business practitioners is that it has provided a series of models that can be used in isolation to add value to business activities, or can be pulled together to create a more complete framework for the effective use of ISps during and after BPR programmes.

6.6 LIMITATIONS, RECENT DEVELOPMENTS AND CONCLUSIONS

6.6.1 Limitations

Following are the key areas represent recognised limitations to the research so far undertaken. As such, they can also be seen as areas that could have been investigated further had there been more time:

- Any research design limits the extent to which the researcher can claim to prove any proposition. Therefore, it has not been possible in this approach to claim an absolute proof of an hypothesis. The research does, however, claim to reveal a rich picture of events, resulting in development from suppositions to propositions as regards the evolving role of ISPs.

- The scope of the research investigation was restricted to examining a number of participating organisations already committed to major change management initiatives. It did not include study of pattern of work in companies not undertaking BPR related initiatives. No conclusions can therefore be drawn as to whether the patterns experienced in the studied companies are also repeated in other, non-process oriented ones.

- Due to the generally extensive nature of BPR related projects, and the use of conference participants as the source list of potential participants, the research scope focus on large, UK based organisations. Therefore, the concluding statements may not reflect the experiences of organisations that are smaller, are not UK based or did not engage in BPR related initiatives.

- The number of participants involved in the final (case study) stage of primary data collection was limited (4). A larger number of cases might have provided an even deeper understanding of the evolving role of the ISp.

- The company-level data analysis and concluding observations provided a general view of the role of the ISp in these organisations. If the scope of the research had been focused on the role of ISp in a specific processes , for example demand management, the general view might have also been validated (or otherwise) in relation to BPR within a specific business area.

6.6.2 Recent Developments

It is almost certain that the recent adoption of new business models and developments in e-business have resulted in the role of ISps to continue to evolve.

It seem likely that these recent developments in electronic commerce will have further placed emphasis on the role of ISp as helping businesses achieve added value. The challenge for the ISp is probably to determine when and how to introduce new technology without seriously undermining existing investment, and this is most true with the current push in developing systems in an "open" technical environment. They probably have to contend with both the pressure of being quick to react to new technology and the task of managing adaptations to new technical environments with a minimum of disruption of existing operations. These statements are, however, merely suppositions until tested by empirical research similar to that reported upon in the current thesis.

One could put forward the proposition that the role of ISp continues to be vital in managing the corporate information resources. One might postulate that it has evolved by adopting an enterprise-wide vision of information management which, in its advanced forms incorporates gateways for business partners information systems. This proposition relates to the notion that the role of ISp is expanding towards information relationship management, through contribution to knowledge creation and transfer relationships in an age when Information and Communications Technologies are becoming ever more pervasive.

The author believes that these recent developments add even more meaning to the study of the evolving role of ISPs, and represent significant areas for ongoing research and analysis.

6.6.3 Conclusion

The conclusion to be drawn from this research is that the ever-changing environment within which businesses are operating in, coupled with ever faster rates of change, requires the adoption of new approaches to the management of IS/IT if organisations are to survive and prosper during their transformation programmes. It is hoped that the

framework presented in the earlier section will help to guide practitioners responding to these ongoing changes.

The proper use of IT/IS within organisations is now of even greater strategic importance than ever before, and the management issues related to IT/IS have therefore taken on greater importance. The role that IS professionals play in managing the corporate information resource continues to evolve. The role of IS specialists appears to be expanding towards that of information relationship management and to knowledge creation. The need for a changed view of IT/IS and ISps has received further impetus in recent years with the emergence and constant evolution of the digital business economy, including business-to-consumer, business-to-employee and business-to-business transaction environments.

Although further research can be done, particularly in relation to ISPs and the emergence of e-Business models, it is hoped that the research presented in this thesis provides at least some indication of the direction such research should take.

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APPENDIX A

Investigation into the role of IS in BPR

Confidentiality

This questionnaire has been designed for academic research purposes only. Measures will be taken to ensure that the information provided is treated in the strictest confidence.

This questionnaire will be quick and easy to fill in and should take no longer than ten minutes to complete.

Please complete all questions and return in the reply paid envelope supplied.

Definitions
For the purposes of this questionnaire the following definitions are used:

Information Management (IM)
IM is the discipline of establishing the information requirements of an organisation and the planning, gathering, storage, processing, retrieval and dissemination of that information as an aid to the effective and efficient running of the organisation.

Information Technology (IT)
IT is the technology architecture employed to acquire, process, store and retrieve information.

Information System (IS)
IS is the systems infrastructure that uses the IM framework to meet the information requirements of the business activities.

Business Process Re-engineering (BPR)
BPR is the term used to describe a major change programme which realigns an organisation in terms of its core processes rather than its functions, in order to experience quantum leaps in critical measures of performance, such as costs, time to market, response times, quality and customer satisfaction.

Process
A set of related activities undertaken to carry out a task.

1. Are you currently undertaking any process re-engineering initiatives? Y/N
If 'Yes' which of the following best describes the initiative?

One or more specific processes [ ]
Organisation wide, all processes [ ]

2. To what extent are these initiatives intended to impact on the performance of the business?
Where '1' describes basic tidy up of the current processes and '6' describes major redesign for radical performance improvement.
Please circle appropriate figure.

1 2 3 4 5 6

3. Which dimensions of performance are you seeking improvements in?
(Multiple entries are acceptable)

a) Work processes [ ]
b) Information flows [ ]
c) Decision / authority structure [ ]
d) Organisation structure [ ]
e) Others [ ] _____

4. How many functions are involved in the initiative?

a) One or two [ ]
b) Most or all [ ]

5. Who has been involved in the setting up of the initiative?
(Multiple entries are acceptable)

a) Senior management [ ]
b) Departmental managers [ ]
c) IS strategists [ ]
d) IT management [ ]
e) IT steering committees [ ]
f) Internal customers [ ]
g) Others [ ] _____

6. Who are / were the change initiative programme owners?
(Multiple entries are acceptable)

a) Senior management [ ]
b) Departmental managers [ ]
c) IS strategists [ ]
d) IT management [ ]
e) IT steering committees [ ]
f) Internal customers [ ]
g) Others [ ] _____

7. At what stage of the initiative were the IS team involved?
(Multiple entries are acceptable)

a) Start of the initiative [ ]
b) When solutions defined [ ]
c) Other [ ] _____

8. Has there been a formal evaluation of any information requirements in terms of the following dimensions of the business?
(Multiple entries are acceptable)

a) Process [ ]
b) Functions [ ]
c) Organisation wide [ ]
d) Internal customers [ ]
e) Others [ ] _____

9. What solutions are being used / planned?
(Multiple entries are acceptable)

a) None yet identified [ ]
b) Groupware applications [ ]
c) Document management systems [ ]
d) Workflow applications [ ]
e) Client-server architecture [ ]
f) Distributed databases [ ]
g) LANs [ ]
h) Other [ ] _____

10. Do you have an IS strategy and planning process linked to the business strategy? Y/N
If 'Yes'

i) who is responsible for carrying out this task?
(Please indicate the primary (P) and secondary (S) participants)

a) Senior management [ ]
b) Departmental management [ ]
c) IS strategists [ ]
d) IT management [ ]
e) IT steering committees [ ]
f) Internal customers [ ]
g) Others [ ] _____

ii) how often is this strategy updated?

a) Quarterly [ ]
b) Six months [ ]
c) Annually [ ]
d) In line with corporate strategy [ ]
e) Other [ ] _____

I would/would not be willing to take part in an interview to follow up this questionnaire. The interview is expected to take no more than one hour.

Thank you for your time in completing this questionnaire

Ms Gelareh Roshan, Research Institute, Aston Business School
The University of Aston, Aston Triangle
Birmingham, B4 7BR

	Q1	One or more processes	All processes	Q2	1	2	3	4	5	6	Q3	Work processes	Information flows	Decision / authority structure	Organisation structure	Others
Group A	12	5	7	12	0	0	0	1	8	3	41	11	10	7	9	4
Distribution		1	1		0	0	0	0	2	0		2	2	2	2	1
Govt.		0	2		0	0	0	0	2	0		1	2	1	2	1
Retail		1	0		0	0	0	0	0	1		1	0	0	1	0
T&T		0	2		0	0	0	0	1	1		2	2	0	2	1
Services		1	1		0	0	0	0	2	0		2	2	2	1	0
Utilities		2	1		0	0	0	1	1	1		3	2	2	1	1
	Q1	One or more processes	All processes	Q2	1	2	3	4	5	6	Q3	Work processes	Information flows	Decision / authority structure	Organisation structure	Others
Group B	16	6	10	16	0	0	0	4	3	9	53	14	14	8	11	6
Chemical		0	4		0	0	0	0	1	3		3	3	1	4	2
Cosmetics		1	0		0	0	0	1	0	0		0	0	0	0	1
Petroleum		1	2		0	0	0	1	1	1		3	3	3	3	1
Auto		1	2		0	0	0	1	1	1		3	3	3	2	2
Manuf.		0	2		0	0	0	0	0	2		2	2	1	1	0
CPG		3	0		0	0	0	1	0	2		3	3	0	1	0
	Q1	One or more processes	All processes	Q2	1	2	3	4	5	6	Q3	Work processes	Information flows	Decision / authority structure	Organisation structure	Others
Group C	16	8	8	16	0	0	2	5	1	8	60	16	13	11	14	6
B & F		8	8		0	0	2	5	1	8		16	13	11	14	6
	Q1	One or more processes	All processes	Q2	1	2	3	4	5	6	Q3	Work processes	Information flows	Decision / authority structure	Organisation structure	Others
Group D	8	3	5	8	0	1	0	3	3	1	25	7	6	4	5	3
IT		2	3		0	1	0	1	2	1		4	4	2	4	2
Telcom.		1	2		0	0	0	2	1	0		3	2	2	1	1
	Q1	One or more processes	All processes	Q2	1	2	3	4	5	6	Q3	Work processes	Information flows	Decision / authority structure	Organisation structure	Others
Unknown	8	3	5	8	0	0	0	2	2	4	28	8	7	5	6	2

	Q4	One or two	Most or all	Q5	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others
Group A	**12**	**2**	**10**	**28**	**12**	**5**	**2**	**5**	**0**	**3**	**1**
Distribution		1	1		2	1	0	2	0	0	0
Govt.		0	2		2	0	0	0	0	0	0
Retail		0	1		1	0	0	0	0	1	0
T&T		0	2		2	2	1	2	0	1	0
Services		0	2		2	1	0	1	0	0	0
Utilities		1	2		3	1	1	0	0	1	1
	Q4	One or two	Most or all	Q5	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others
Group B	**16**	**3**	**13**	**42**	**14**	**9**	**6**	**4**	**1**	**4**	**4**
Chemical		0	4		3	3	1	2	0	2	2
Cosmetics		1	0		1	0	0	1	0	0	0
Petroleum		0	3		3	2	1	0	0	0	0
Auto		1	2		2	1	1	1	0	1	1
Manuf.		0	2		2	1	1	0	0	0	1
CPG		1	2		3	2	2	0	1	1	0
	Q4	One or two	Most or all	Q5	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others
Group C	**16**	**3**	**13**	**53**	**16**	**7**	**8**	**7**	**1**	**9**	**5**
B & F		3	13		16	7	8	7	1	9	5
	Q4	One or two	Most or all	Q5	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others
Group D	**8**	**1**	**7**	**23**	**8**	**5**	**2**	**1**	**1**	**3**	**3**
IT		1	4		5	3	0	0	0	1	1
Telcom.		0	3		3	2	2	1	1	2	2
	Q4	One or two	Most or all	Q5	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others
Unknown	**8**	**1**	**7**	**26**	**8**	**5**	**2**	**4**	**2**	**4**	**1**

	Q6	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others	Q7	Start of the initiative	When solutions defined	Other
Group A	**15**	**10**	**1**	**0**	**3**	**0**	**1**	**0**	**13**	**8**	**3**	**2**
Distribution		2	0	0	0	0	0	0		2	1	0
Govt.		2	0	0	0	0	0	0		1	1	0
Retail		0	0	0	0	0	1	0		0	1	0
T&T		2	0	0	2	0	0	0		2	0	0
Services		2	0	0	1	0	0	0		1	0	1
Utilities		2	1	0	0	0	0	0		2	0	1
	Q6	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others	Q7	Start of the initiative	When solutions defined	Other
Group B	**31**	**13**	**8**	**2**	**5**	**0**	**2**	**1**	**17**	**12**	**3**	**2**
Chemical		2	2	0	2	0	1	0		3	0	1
Cosmetics		1	1	0	1	0	0	0		0	1	0
Petroleum		3	2	1	0	0	1	1		3	1	0
Auto		2	1	0	1	0	0	0		3	0	0
Manuf.		2	1	1	0	0	0	0		1	0	1
CPG		3	1	0	1	0	0	0		2	1	0
	Q6	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others	Q7	Start of the initiative	When solutions defined	Other
Group C	**27**	**15**	**4**	**0**	**2**	**1**	**2**	**3**	**19**	**11**	**4**	**4**
B & F		15	4	0	2	1	2	3		11	4	4
	Q6	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others	Q7	Start of the initiative	When solutions defined	Other
Group D	**16**	**7**	**4**	**0**	**1**	**1**	**1**	**2**	**9**	**5**	**3**	**1**
IT		4	3	0	0	0	0	1		3	1	0
Telcom.		3	1	0	1	1	1	1		2	2	1
	Q6	Snr. Management	Dept. Mgrs	IS Strategists	IT Management	IT Steering Committee	Internal Customers	Others	Q7	Start of the initiative	When solutions defined	Other
Unknown	**12**	**7**	**2**	**0**	**1**	**0**	**1**	**1**	**10**	**6**	**3**	**1**

	Q8	Process	Functions	Organisation wide	Internal customers	Others	Q9	None yet identified	Groupware applications	Document management systems	Workflow applications	Client-server architecture	Distributed databases	LANs	Other
Group A	*29*	7	6	6	5	5	*40*	3	4	7	7	7	5	6	1
Distribution		0	0	0	1	2		1	0	0	1	0	0	0	0
Govt.		2	2	2	1	1		0	1	2	1	2	2	2	0
Retail		0	0	0	1	0		1	0	0	0	0	0	0	0
T&T		2	2	1	1	0		0	1	1	2	2	1	1	0
Services		1	1	1	0	1		0	1	2	2	1	0	1	1
Utilities		2	1	2	1	1		1	1	2	1	2	2	2	0
	Q8	Process	Functions	Organisation wide	Internal customers	Others	Q9	None yet identified	Groupware applications	Document management systems	Workflow applications	Client-server architecture	Distributed databases	LANs	Other
Group B	*37*	14	9	6	7	1	*58*	1	7	7	8	12	9	10	4
Chemical		3	3	1	3	1		0	3	2	2	2	2	4	2
Cosmetics		1	0	0	0	0		0	0	0	1	1	1	0	0
Petroleum		2	1	2	2	0		0	1	2	2	3	2	3	1
Auto		3	1	1	1	0		1	1	1	1	2	2	2	1
Manuf.		2	1	1	0	0		0	1	1	2	2	1	1	0
CPG		3	3	1	1	0		0	1	1	0	2	1	0	0
	Q8	Process	Functions	Organisation wide	Internal customers	Others	Q9	None yet identified	Groupware applications	Document management systems	Workflow applications	Client-server architecture	Distributed databases	LANs	Other
Group C	*32*	11	8	6	4	3	*49*	3	5	9	11	5	4	7	5
B & F		11	8	6	4	3		3	5	9	11	5	4	7	5
	Q8	Process	Functions	Organisation wide	Internal customers	Others	Q9	None yet identified	Groupware applications	Document management systems	Workflow applications	Client-server architecture	Distributed databases	LANs	Other
Group D	*12*	5	2	2	2	1	*20*	2	2	2	2	3	1	5	3
IT		3	1	1	1	0		1	0	0	0	1	1	3	1
Telcom.		2	1	1	1	1		1	2	2	2	2	0	2	2
	Q8	Process	Functions	Organisation wide	Internal customers	Others	Q9	None yet identified	Groupware applications	Document management systems	Workflow applications	Client-server architecture	Distributed databases	LANs	Other
Unknown	*23*	8	4	5	5	1	*29*	0	2	3	4	7	5	7	1

	Q10	No	Yes	Primary	Senior management	Departmental management	IS strategists	IT management	IT steering committees	Internal customers	Others
Group A	**12**	**4**	**8**	**17**	**3**	**1**	**2**	**8**	**2**	**1**	**0**
Distribution			2		0	0	0	2	0	0	0
Govt.			2		0	0	0	2	1	0	0
Retail			0		0	0	0	0	0	0	0
T&T			2		1	1	1	2	1	1	0
Services			1		1	0	0	1	0	0	0
Utilities			1		1	0	1	1	0	0	0
	Q10	**No**	**Yes**	**Primary**	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Group B	**16**	**2**	**14**	**30**	**7**	**6**	**8**	**4**	**3**	**2**	**0**
Chemical			2		0	2	1	1	0	1	0
Cosmetics			1		0	0	0	0	1	0	0
Petroleum			3		3	2	2	2	1	1	0
Auto			3		1	0	1	1	1	0	0
Manuf.			2		1	1	2	0	0	0	0
CPG			3		2	1	2	0	0	0	0
	Q10	**No**	**Yes**	**Primary**	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Group C	**16**	**3**	**13**	**19**	**5**	**0**	**7**	**5**	**2**	**0**	**0**
B & F			13		5	0	7	5	2	0	0
	Q10	**No**	**Yes**	**Primary**	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Group D	**8**	**2**	**6**	**10**	**3**	**0**	**1**	**3**	**3**	**0**	**0**
IT			4		2	0	1	2	2	0	0
Telcom.			2		1	0	0	1	1	0	0
	Q10	**No**	**Yes**	**Primary**	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Unknown	**8**	**1**	**7**	**12**	**4**	**0**	**3**	**4**	**1**	**0**	**0**

	Secondary	Senior management	Departmental management	IS strategists	IT management	IT steering committees	Internal customers	Others
Group A	**14**	**6**	**4**	**1**	**2**	**0**	**1**	**0**
Distribution		1	0	0	0	0	0	0
Govt.		2	1	0	0	0	0	0
Retail		0	0	0	0	0	0	0
T&T		2	2	0	1	0	1	0
Services		1	0	0	1	0	0	0
Utilities		0	1	1	0	0	0	0
	Secondary	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Group B	**28**	**7**	**4**	**2**	**6**	**6**	**3**	**0**
Chemical		2	0	0	1	1	0	0
Cosmetics		0	0	0	0	1	0	0
Petroleum		1	1	1	2	0	1	0
Auto		2	0	0	0	0	0	0
Manuf.		1	1	1	1	1	1	0
CPG		1	2	0	2	3	1	0
	Secondary	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Group C	**23**	**8**	**1**	**3**	**5**	**2**	**3**	**1**
B & F		8	1	3	5	2	3	1
	Secondary	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Group D	**10**	**2**	**3**	**1**	**1**	**1**	**2**	**0**
IT		1	2	1	1	1	1	0
Telcom.		1	1	0	0	0	1	0
	Secondary	**Senior management**	**Departmental management**	**IS strategists**	**IT management**	**IT steering committees**	**Internal customers**	**Others**
Unknown	**9**	**4**	**1**	**1**	**0**	**2**	**1**	**0**

	10	*Quarterly*	*Six monthly*	*Annually*	*In line with corporate strategy*	*Other*	*Interview*
Group A	***18***	**0**	**1**	**4**	**5**	**0**	**8**
Distribution		0	0	1	1	0	0
Govt.		0	0	1	2	0	1
Retail		0	0	0	0	0	1
T&T		0	1	1	0	0	2
Services		0	0	0	1	0	1
Utilities		0	0	1	1	0	3
	10	*Quarterly*	*Six monthly*	*Annually*	*In line with corporate strategy*	*Other*	*Interview*
Group B	***27***	**1**	**1**	**5**	**8**	**2**	**10**
Chemical		0	1	1	1	0	4
Cosmetics		0	0	1	0	0	0
Petroleum		0	0	2	2	1	2
Auto		1	0	0	2	0	2
Manuf.		0	0	0	1	1	2
CPG		0	0	1	2	0	0
	10	*Quarterly*	*Six monthly*	*Annually*	*In line with corporate strategy*	*Other*	*Interview*
Group C	***24***	**1**	**2**	**4**	**6**	**2**	**9**
B & F		1	2	4	6	2	9
	10	*Quarterly*	*Six monthly*	*Annually*	*In line with corporate strategy*	*Other*	*Interview*
Group D	***12***	**1**	**0**	**3**	**4**	**1**	**3**
IT		1	0	2	2	1	3
Telcom.		0	0	1	2	0	0
	10	*Quarterly*	*Six monthly*	*Annually*	*In line with corporate strategy*	*Other*	*Interview*
Unknown	***11***	**2**	**0**	**1**	**4**	**1**	**3**

APPENDIX B

Interview Structure Prompt Sheet

- Why did you decide to BPR?
- What was the role of the ISp before BPR?
- What was the role of the ISp during BPR?
- What is the role of the ISp after BPR?
- What will be the role of the ISp in the future?
- Have you achieved the results expected from the project?
- What would you have done differently?